Call-A.P.P.L.E.™

Volume 8, Number 7
July 1985

World's Largest Apple User Group Magazine

$3.00 U.S.

Anomalies of Applesoft Arithmetic

INSIDE:

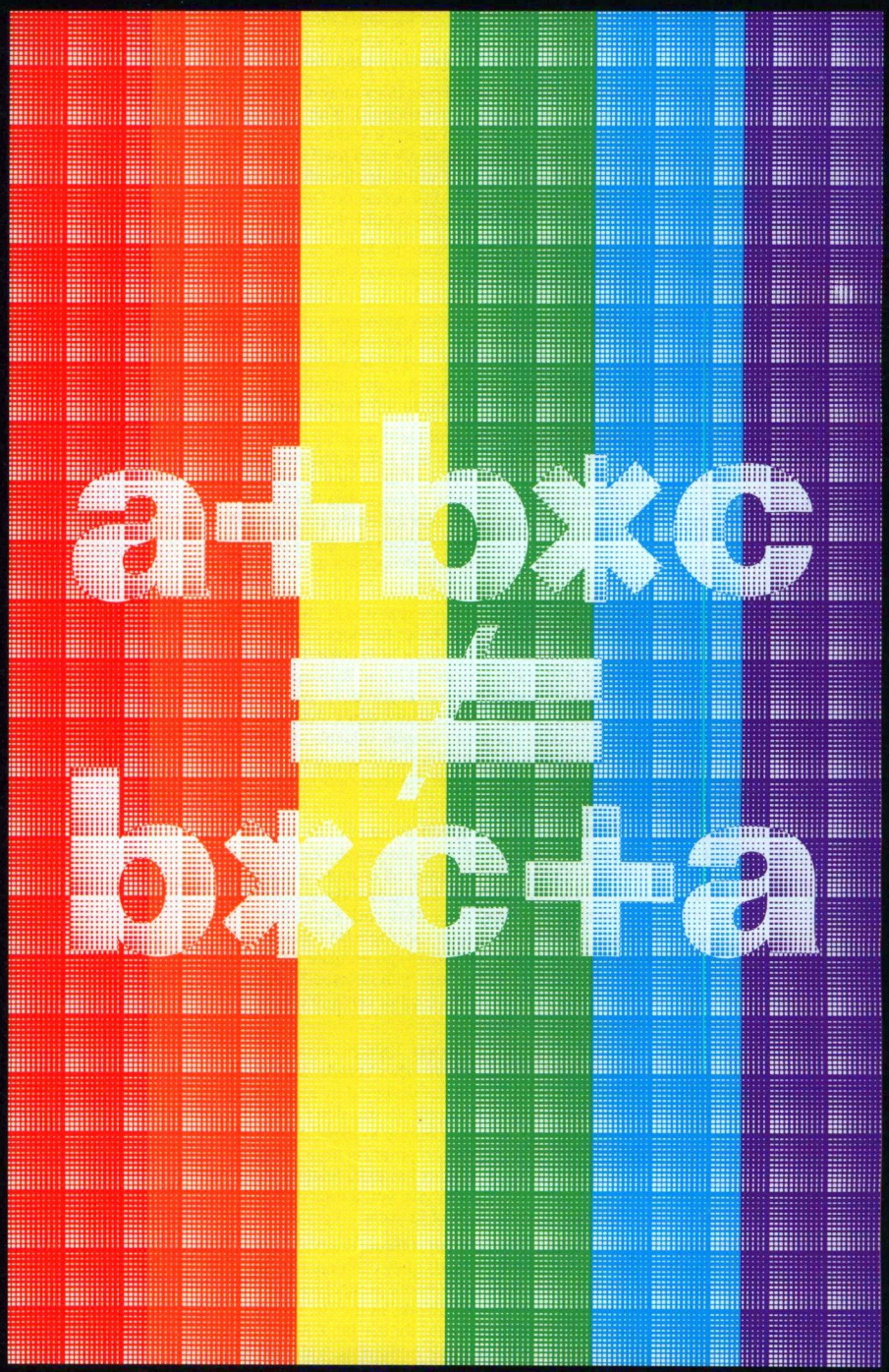
- Quirks of Applesoft Floating-point Numerics
- SANE Programming
- Using Apple Writer's WPL
- THE Spreadsheet as Cabinetmaker
- Adjustable Planning Calendar

MACINTOSH:

- Telecommunication tips
- Transferring data from Apple II to Mac

PLUS:

- Exclusive Inside View of Apple Computer, Incorporated
- New Products
- and more. . .



Apple PugetSound Program Library Exchange

Just A Few Reasons Why RAMWORKS™ Outsells ALL Other RAM Cards COMBINED

APPLEWORKS MEMORY Even though Ramworks enhances and expands a VAST ARRAY of other programs, Appleworks is our claim to fame. A 64K Ramworks will ADD 46K to your available desktop memory, a 128K Ramworks will ADD 91K, a 256K Ramworks will ADD 182K, a 512K Ramworks will ADD 364K and a 1 meg Ramworks will give you nearly an 800K desktop. And it's all done automatically! When you plug in more memory chips into your Ramworks card, Appleworks will find them—automatically. Ramworks also increases the maximum number of records from 1350 to 4300. And should you ever create a file larger than your disk capacity, Ramworks will automatically prompt you to insert more disks, so that any size file can be saved on regular floppies or a hard disk.

APPLEWORKS SPEED AND POWER Ramworks does more than just increase the desktop memory (as if that weren't enough). With Ramworks, Appleworks will be able to run up to 20 times faster. If you buy a 256K or larger Ramworks card, Appleworks will automatically load itself in Ramworks. This greatly increases the speed at which Appleworks operates by eliminating all that nasty, time consuming disk access on Drive 1. These are but a few reasons why we say that Ramworks is Appleworks' best friend.

EXPANDABILITY Ramworks was designed with the future in mind. As your needs increase, so can Ramworks. Clear instructions show you how to plug in more memory.

CO-PROCESSOR POWER A memory expansion connector on Ramworks will allow future co-processor cards to access the Ramworks memory, so you'll be able to take advantage of the new 16 and 32 bit microprocessors. This connector will also allow Ramworks to be expanded another 2 megabytes, so as memory technology improves, so will Ramworks.

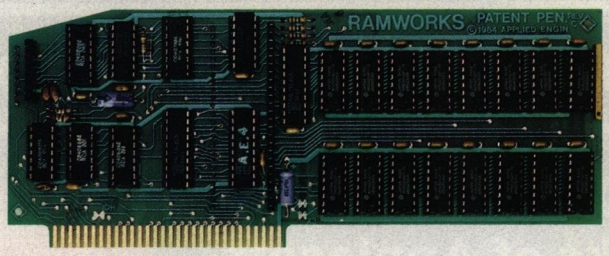
SPEED Today, as programs become more and more sophisticated, they inevitably become larger. And many of today's best selling programs (like Appleworks) won't fit in a 128K Apple, so many of these new larger programs continually go back to disk in search of more data. With Ramworks, you can have enough memory so that the entire program will be loaded into Ramworks' memory. This greatly increases the speed of software because your disk runs at 300 RPM, but Ramworks operates at the speed of light!

COLOR The same slot that's used for memory expansion is also the slot that's used for RGB color display, so all those lesser memory cards of yesterday make you decide in advance if you want RGB color. Ramworks lets you decide later to add RGB color. For only $129, an RGB option can be added to Ramworks to give you double high resolution color graphics and 80 column text. All with a razor sharp, vivid brilliance that's unsurpassed in the industry. The RGB option does not waste another valuable slot, but rather plugs into the back of Ramworks and attaches to any Apple compatible monitor. Remember, you can order the RGB option with your Ramworks or add it on at a later date.

COMPATIBILITY, OF THE SOFTWARE KIND Programs like Appleworks, Magic Office System, Flashcalc, The Spread Sheet, Diverse-A-Dos, Supercalc, Magicalc and many others automatically recognize all or most of Ramworks' memory (512K is average). The simple fact is that Ramworks is compatible with more off-the-shelf software than any other RAM card. Ramworks is 100% compatible with ALL software written for the Apple 80 column and extended 80 column card. Additionally, Ramworks can emulate other RAM cards so software written for other cards will run without modification. Software written for Ramworks will not work on other cards. We can emulate others, but others can't emulate us.

COMPATIBILITY, OF THE HARDWARE KIND Unlike others, Ramworks is fully compatible with hardware add on's from other companies, like the Sider and Profile hard disks. And Ramworks was designed in accordance with the official expansion rules defined by Apple so you don't have to worry about compatibility problems. As you continue to expand and make your Apple more powerful with other expansion products from Applied Engineering, you'll appreciate how each product has extra features designed to work with Ramworks and other products to give you a total performance package that is more powerful than the sum of its parts.

IT'S POPULAR Popularity translates into great software support because software companies can't support all RAM cards, they can only support the ones their customers are likely to own. And software companies appreciate the fact that when they write software for Ramworks in the IIe, they're also writing software for our memory expansion card for the IIc, Z-RAM. And our customer list reads like the Who's Who of Apple computing with just about every software company in the land buying one, including Apple Computer



(in the hundreds), Rupert Lissner, and Steve Wozniak (we didn't give one to Mr. Wozniak just to use his name, 2 one meg Ramworks were paid for at full price).

IT'S FROM APPLIED ENGINEERING Unlike most of the competition, we only make accessories for Apple, so we'll never spend your money on IBM product research. Applied Engineering's years of experience and wide product line really pays off, and because of our high sales levels we buy most of our I.C. chips factory direct. So don't let our low prices fool you, they're caused by high volume production. That's why we can offer the most memory for the least money. Guaranteed!

IT'S GOT IT ALL

- ☑ Sharp 80 Column Text
- ☑ Double high resolution graphics (with or without RGB option)
- ☑ User Expandable to 1 Megabyte
- ☑ Can Use 64K or 256K RAMS in any combination
- ☑ Adds Memory to Appleworks
- ☑ Accelerates Appleworks
- ☑ 100% Compatibility with All IIe software
- ☑ RAM Disk software available, compatible with Applesoft, PRO-DOS, DOS 3.3 and PASCAL ($29)
- ☑ RAM Disk available for CP/M ($29). (This program is included with our CP/M card)
- ☑ Visicalc preboot available ($29)
- ☑ RGB option
- ☑ Takes only one slot
- ☑ 3 year no hassle warranty

THE PATENT OFFICE HAS ONE There are many advanced features on Ramworks, but two parts of the design are so advanced we applied for patents. One patent application deals with our ultra fast, ultra smooth 80 column screen display, and the other patent application deals with our ingenious way of dramatically reducing the power and heat of memory chips and improving reliability at the same time.

HERE TODAY, HERE TOMORROW In the seven years we've been making products for the Apple, we've seen a lot of companies come and go. Although nothing is forever, we're growing, expanding and we're profitable. And we are totally committed to Apple computing, which means you'll never run out of things to do with Ramworks. Or for that matter, reasons to buy one.

Ramworks™ with 64K	**$179**
Ramworks™ with 128K	**$249**
Ramworks™ with 256K	**$299**
Ramworks™ with 512K	**$399**
Ramworks™ with 1 MEG	**$649**
RGB Option (can be added later)	**$129**

Call (214) 241-6060
9 a.m. to 11 p.m. 7 days a week or send check or money order to:
Applied Engineering, P. O. Box 798, Carrollton, Texas 75006

NOTICE: Not all sellers of Ramworks™ are authorized dealers. Please buy direct from Applied Engineering or an authorized dealer. If you wish to verify a dealer, please call us.

MasterCard VISA and
C.O.D. welcome. No extra charge for credit cards. Texas Residents add 5⅛% sales tax. Add $10.00 of outside U.S.A.

APPLIED ENGINEERING
"We Set the Standard"

Circle 50 on Reader Service Card

Call-A.P.P.L.E.™

Volume 8, Number 7 — July 1985

Official Publication of A.P.P.L.E. Co-op

World's Largest Apple Users Group

MEMBER SERVICES

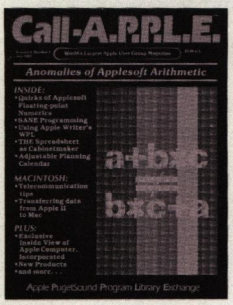
24 Hour Toll-Free Orders & Membership
1-800-426-3667
(except Washington state)

HOTLINE
Programming/Technical Assistance
(206) 251-0071
9 am to 3 pm
Weekdays (Pacific Time)

A.P.P.L.E. CRATE BULLETIN BOARD
(206) 251-0543
SEE MEMBER SERVICES PAGE FOR LIST OF CONSULTANTS

A.P.P.L.E. MAIN OFFICE:
(206) 251-5222

About the Cover



Do you believe the rules of algebra hold true on the Apple? As suggested by this month's cover design, our main feature article may shake your faith in the computer's mathematical precision.

Call-A.P.P.L.E. is published monthly by Apple PugetSound Program Library Exchange, 290 S.W. 43rd St., Renton, Washington 98055, (206) 251-5222. Basic subscription price is $21 per year, or $26 per year including membership in A.P.P.L.E. Co-op. For First Class mail or foreign subscriptions add additional postage listed elsewhere.

Application to mail at second class postage rates is pending at Renton, Washington, and additional mailing office. POSTMASTER: Send address changes to *Call-A.P.P.L.E.*, Address Change, 290 S.W. 43rd St., Renton, Washington 98055.

Entire contents copyright© 1985 by Apple PugetSound Program Library Exchange. All rights reserved. Authors and advertisers are responsible for the factual accuracy of their submitted material. Opinions expressed do not necessarily represent those of A.P.P.L.E. Apple user groups may reprint any articles for non-commercial purposes, provided author, title, and publication credits are given, and written notice is sent to our editorial office.

A.P.P.L.E. Co-op is an independent support group of Apple product users, and is not affiliated with Apple Computer, Inc. The following are trademarks of Apple Computer, Inc.: Apple, Apple *II*, Apple *II+*, Apple *IIe*, Apple *IIc*, Macintosh, Macintosh XL, MacPaint, MacWrite, Lisa, DOS 3.3, ProDOS, AppleWorks, and Applesoft.

Printed in U.S.A.

Features

12 **Apple Computer Incorporated: An Inside View**
Quincy Flugelheidt
"If my boss calls, get his name"

15 **Floating-point Arithmetic in Applesoft BASIC**
James W. Thomas
Little-known irregularities in calculation accuracy

19 **SANE Programming on the Apple**
J. B. Koons
A numeric computation package for demanding mathematicians

21 **The Secrets of Apple Writer's WPL — Part 2**
Richard Loggins
Using variables and subroutines to access files

25 **THE Spreadsheet as Cabinetmaker**
John Geddis
Building structures with THE Spreadsheet—literally

31 **Adjustable Planning Calendar**
Harold Shuckhart
A program that creates customized date blocks

Macintosh

34 **MacinTips— Mac Up and Down**
Ken Watters
Telecommunicating Macintosh style

36 **An Apple-to-Mac Connection**
Jan Eugenides
Bare-bones method of transfering data from Apple II to Mac

49 **MacinPlace**
Browsing through the new Mac products

Letters

38 **A.P.P.L.E. Doctor**
Bruce F. Field
Intensive care for your computer problems

41 **Write -A.P.P.L.E.**
Readers' forum

Departments

5 **The INNER CIRCUIT**
Don Elman
By the numbers

5 **Planting a Seed**
Peter C. Weiglin
Current trends in the computer market

8 **Member Billboard / Member Services**
Co-op information

9 **A.P.P.L.E. Co-op New Products**

46 **The Marketplace**
What's new for the Apple

51 **Unclassifieds**

ADVERTISER INDEX

Applied Engineering . 2,7,30
Apricorn 52
Artificial Intelligence Research Group 39
Axlon 14
Beagle Bros 26,27
Blankenship Associates 16
Central Point Software 17
Coit Valley Computers 6
Common Logic 39
David Data 20
Digital Vision 18
Harvest Software 34
hotCider 4
Human Systems Dynamics 51
Interactive Microware 13,20
Laing Electronics 23
Memory Plus Distributors 47
Norwich Data Services . . 37
Orbital Systems 45
Prof. Jones 22
Roger Wagner Publishing 24
Soft Wear Company 45
Southern California Research Group 11
10/10 Software 18
VF Associates 48
Vilberg Brothers Computing 34
VOAD Systems 35
Woodchuck Industries 29

Get 3 Never-Before Published Bonus Programs FREE!

Announcing hotCider

A ready-to-run, menu-driven disk loaded with the greatest Apple II* software programs from inCider magazine.

Best programs

hotCider was developed by inCider's technical editors Bob Ryan and Kerry Lanz. Together, they've assembled twelve of the very best programs ever submitted to inCider. There are programs for business, home management, education, entertainment, and graphics all on a high-quality floppy disk.

Best offered

You get the best inCider has to offer. Standouts such as:

VisiData—a unique list handler that works like a spreadsheet.

Poster Printer—say anything you would like to in a BIG way with your printer.

Rembrandt—discover your hidden talent as an artist with this drawing program.

Wizfix—a fun utility that gives you control of Wizardry game character development.

Doing Windows—create Macintosh-style windows on your Apple II.

ProCAT—a great ProDOS catalog utility.

Unpublished programs

In addition to these and other outstanding inCider programs YOU'LL GET THREE PREVIOUSLY UNPUBLISHED PROGRAMS. **Cider Zap.** A full featured utility that lets you examine and edit data right from the disk. **Bongo's Bash.** Bongo the gorilla is trapped in a maze full of bananas. But watch out for the robot sentries! **Sector Mapper.** Displays DOS 3.3 sector usage. A great companion to Cider Zap. That's three commercial quality programs that have never been seen before! And hotCider also includes its own documentation booklet.

Available in May

hotCider Volume I will be available beginning in May at just $21.47. That's just a fraction of what you would pay for one of these programs if they were commercially available elsewhere. And coming in October . . . look for hotCider Volume II!

To get your disk, simply fill out the coupon or attached order card with payment and drop it in the mail today. For faster service, call **TOLL FREE 1-800-258-5473** or in New Hampshire call 1-924-9471.

*Apple and the Apple logo are registered trademarks of Apple Computer, Inc.

YES! I want the great taste of Apple II programming with hotCider. Send me hotCider Volume I on disk for $21.47.

☐ Payment Enclosed ☐ MC ☐ Visa ☐ AE **CA-75**

Card No. Exp. Date

Signature

Name

Address

City State Zip

Prices include postage and handling. Foreign airmail please add $1.50 per item. US funds drawn on US banks only.

hotCider • 80 Pine St. • Peterborough, NH • 03458

The INNER CIRCUIT

Don Elman

The Numbers Game

Scratch any computer and what do you find? Numbers.

Dating back to its very first generation, the "digital" computer's fundamental advantage over the human brain has always been its capacity for faster and more accurate manipulation of numbers. If it hadn't been for society's increasing demand to process larger numbers in less time with greater precision, the computer might never have developed into a commercially viable product. Regardless of one's attitude toward computers, practically no one would deny that they are the best available tools for flawless computation.

Those familiar with the computer's inner workings, however, know that the illusion of effortless numeric calculation is not easily achieved. Binary logic circuits simply don't operate on the same wavelength as most human mathematicians, who stubbornly cling to the decimal system. Developers of systems and languages have frequently reinvented the wheel in solving the translation problems, with few standards to go by until recently. If you've always assumed that the one thing computers do consistently well is arithmetic, then some of this month's features may shake you out of your complacency

In This Issue

Our main article, **Floating-point Arithmetic in Applesoft BASIC** by James W. Thomas, is a fascinating compilation of many unexpected instances where the numbers just don't add up in the Apple's most widely-used language. The author, now head of Apple Computer's Numerics Group, spends his time developing better ways of utilizing the computer's capacity for mathematical precision. One of those ways is described in the following review article, **SANE Programming on the Apple** by J. B. Koons.

Other features this month include a second installment of Richard Loggins' **The Secrets of Apple Writer's WPL**, and two very practical applications of the Apple's numeric abilities—**THE Spreadsheet as Cabinetmaker** by John Geddis, and **Adjustable Planning Calendar** by Harold Shuckhart. You'll also find more technical tips on Macintosh and Apple II, as well as new products and all the usual stuff.

But before getting to all that, we treat you to an inside view of recent changes in Apple Computer, Incorporated, which has been struggling with its own "numbers" problems of late—ranging from falling stock prices and sales figures to layoffs and plant closings.

Planting a Seed

Peter C. Weiglin

If we are to believe the business analysts and soothsayers, the "Personal Computer Market" is in bad, bad shape. Company after company has been reporting lower earnings than expected, has been trimming the payroll, has been interrupting production because of excessive inventory, has been shaking up its management, and has been lamenting the poor state of the market.

Even the television news reporters, with their customary lack of depth, have been picking up the refrain; clearly, the personal computer boom is over, and the public is now free to go on to other things. As we explored in an earlier edition, the computer dealers have not been having an easy time of it; people just have not been buying as expected. When they do buy, the customers go for the lowest price instead of the best "service". The people just aren't cooperating with the forecasters.

Based on those forecasts of never-ending growth, a number of large corporations has entered the personal computer arena. The word was that the days

A.P.P.L.E. Co-op

Apple PugetSound Program Library Exchange

Officers and Directors

Dick Hubert President
Bob Huelsdonk Vice President
Dave DeGroot Secretary
Bob Clardy Treasurer
Dave Lingwood Director
Val J. Golding Director
Don Williams Director

Administration

Dick Hubert Executive Director
Don Steele General Manager
Charles Stillman Product Development/ Education
Will Clardy Marketing
Don Elman Publications

Call-A.P.P.L.E.

Don Elman Managing Editor
Peter C. Weiglin Editor
Kathryn H. Suther Associate Editor
Mary Hubert Art/Production

Walt Gardner Technical Consultant
Butch Greathouse Technical Consultant
Larry Neibauer Technical Consultant

Advertising

John Elliott National Coordinator (206) 251-5222

JE Publishers' Representative, 6855 Santa Monica Blvd., Los Angeles, CA 90038 — California Representative (213) 467-2266

Paul McGinnis Company, 690 Broadway, Massapequa, NY 11758 — East Coast Representative (212) 490-1021

Member Services

Main Office
(206) 251-5222

Order Desk Tracing
Member Information Education, Classes
Retail Store Dealer Services
Marketing Technical Support
Testing and Evaluation Operations

24 hour toll-free order line:
1-800-426-3667
(except Washington state)
Orders ONLY
Information not available

Programming/Technical Assistance
Call-A.P.P.L.E. HOTLINE
(206) 251-0071
9am to 3pm
(Pacific Time)
weekdays

A.P.P.L.E. Crate Bulletin Board
(206) 251-0543

Meetings
7:30pm third Tuesday of each month
A.P.P.L.E. Office
290 S.W. 43rd St.
Renton, WA 98055
(except as noted)

Membership information
is available on postpaid tear-off card inside

A.P.P.L.E. on the SOURCE
A special section of The Source is open only to A.P.P.L.E. members who may download Call-A.P.P.L.E. programs. To access, type: CALL-APPLE, from Source command mode. To register, send mail to ST1570 with your name, membership number, expiration date and Source account number.

BETTER THAN RAMWORKS™

MultiRam™ (formerly MaxiRam) offers everything Ramworks does and adds much more with unlimited future use & less power drain. **AVAILABLE NOW** for both the **IIe** and **IIc** at lower cost from Coit Valley Computers:

	Ramworks	MultiRam IIe
100% Extended 80 Compatable	Yes	**Yes**
Warranty	3 yr	**5 yr**
Main Board Maximum	512k	**768k**
Piggyback Board Maximum	512k	**768k + FREE RGB**
Total Memory Possible	1024k	**1536k (50% MORE!)**
AppleWorks™ Expander Software	Up to 735k	**UP TO 1100k**
Ramdrive Software	$29	**FREE**
RGB option	$129	**FREE on Piggyback**
65816/8086/6800 CPU Port	No!	**Built in FREE**

	Ramworks Comparable (Ramdrive Extra)	Coit Valley Computer Price (Ramdrive FREE)
64k **MultiRam** IIe Card	179.	**159.**
128k **MultiRam** IIe Card	249.	**215.**
256k **MultiRam** IIe Card	299.	**278.**
512k **MultiRam** IIe Card	399.	**376.**
768k **MultiRam** IIe Card	653.	**480. (WOW!)**
1024k **MultiRam** IIe Card	649. (No RGB)	**709. (FREE RGB)**
1280k **MultiRam** IIe Card	No!	**797. (FREE RGB)**
1536k **MultiRam** IIe Card	No!	**885. (FREE RGB)**
256k **MultiRam IIc** Card	449. (Z-80)	**325. (No Z-80)**
512k **MultiRam IIc** Card	649. (Z-80)	**459. (No Z-80)**

MORE MEMORY

Our **FAST** (150 NS) RAM chips, **GUARANTEED** 1 year, can expand MultiRam cards up to 1536k or Ramworks & Legend™ cards up to 1024k! We can expand Multicore™, Z-ram & others also. Easy installation instructions included. CALL FOR LATEST PRICING.

	List	Our Price
64k Memory Expander Chips	70.	**35.**
128k Memory Expander Chips	140.	**62.**
256k Memory Expander Chips	150.	**124.**
512k Memory Expander Chips	300.	**227.**
1024k Memory Expander Chips	600.	**424.**
AppleWorks™ Program	250.	**210.**
IIe Enhancement Kit	70.	**62.**
Pico™ Slim Drive IIe, IIc	270.	**178.**
Bernoulli™ Box Macintosh™	1995.	**1765.**
MultiView™ 80/160 Card	350.	**289.**
Imagewriter™ (15")	749.	**626.**
PC Megastore™ 20 Meg Hard Disk & 25 Meg Tape Backup II+, IIe	3595.	**2889. (WOW!)**

Terms: For fastest delivery send Cashier's/Certified check, Money Order. C.O.D. (add $2) & personal checks accepted (allow 14 days). Add $3 shipping & phone # to all orders. Add 3% for MasterCard/Visa (include #/expir). Tex res add 6⅛% tax. **CALL FOR LATEST PRICES!**

MultiRam/Multiview, Ramworks/Z-ram, Appleworks/Macintosh, Legend, Pico, Bernoulli, PC Megastore, Multicore respective trademarks of Checkmate Tech, Applied Engineering, Apple Comp, Legend Ind, WGE Int, Iomega, Ampex, Quadram.

COIT VALLEY COMPUTERS **(214) 234-5047**
14055 Waterfall Way Dallas, Texas 75240

Circle 59 on Reader Service Card

of the smaller firm were numbered. User alliances like A.P.P.L.E. were passe. The Boys with the Bankrolls would come in and show us how to do it.

Well, they haven't. At the recent Consumer Electronics Show, it was notable that the megabuck marketers had sharply scaled back their personal computer involvement, particularly in software. The reason is simple: money, not enough of.

What?? Somebody like CBS Software didn't have the money to go to CES in style?? Well, they *had* the money, and they still *have* it. Whereas a small company may struggle with less cash than it would like, a large corporation can enter a market with all the trappings of power. But the corporate workings are not much different from the venture capital process. A project leader gets $X to fund an activity, based on projections of future profits. A project is funded after competition with other projects, based on return on investment to the corporation.

And then the market fails to cooperate with the forecasters, and results are not up to expectations. Friends, if you had heard that the venture capital firms are unsympathetic to entrepreneurs in such a situation, you are right. Now let me introduce you to the gimlet-eyed Corporate Finance Committee. Compared to these folks, the venture capitalists are pussycats. At least the venture capitalists know something about the computer and its marketplace; the corporate finance committees may have weighed the investment in that computer software project against airplanes, biochemicals, buying up bankrupt farms, missiles, insurance, or a thousand other possibilities. The numbers and only the numbers formed the basis for their decision.

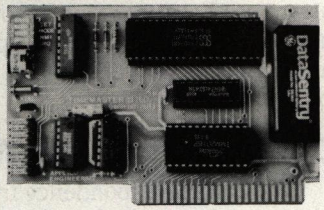
When that decision fails to meet expectations, there are too many other project leaders clamoring for attention to let the wounded project continue. Note that we're not even talking about losing money here. We're talking about failure to make X per cent profit by Y date. So the project is cut back or terminated faster than a new TV sitcom. The most outstanding case in point is the IBM PCjr.

Take heart, entrepreneurs. It is not only the small firms who are the losers in a shakeout. It is also large firms that find it "economically undesirable" to continue. In fact, with the market approaching rational levels of growth, the fast-buck boys are seeking other pastures. They won't be missed.

The winners are likely to be you and me, the users.

Designed For Those Who Only Accept The Best!

TIMEMASTER II H.O.™



- Absolutely, positively, totally PRO-DOS and DOS 3.3 compatible.
- Time in hours, minutes, seconds and milliseconds (the ONLY PRO-DOS compatible card with millisecond capability).
- 24 hour military format or 12 hour with AM/PM format.
- Date with year, month, day of week and leap year.
- Eight software controlled interrupts so you can run two programs at the same time (many examples are included).
- The only card recognized by both the DOS 3.3 and PRO-DOS versions of Apple Writer IIe.
- Appleworks will now time and date stamp all your data automatically.
- The only clock card that will display the time and date on the Appleworks screen.
- Compatible with ALL of Apple's languages. Many sample programs for machine code, Applesoft, CP/M and Pascal on 2 disks.
- On-board timer lets you time any interval up to 48 days long down to the nearest millisecond.
- Auto-recharging nickle-cadmium battery will last over 20 years.
- Two BSR/serial ports for future expansion.

	PRO-DOS COMPATIBLE	INCLUDES DOS DATER	MILLISECOND TIME	YEAR DATA	LARGEST SAMPLE SOFTWARE	REMOTE SET PORT	BSR PORT	EMULATES ALL OTHER CLOCKS
H.O	YES	YES	YES	YES	YES	YES	YES	YES
BRAND A	NO	NO	YES	NO	NO	NO	NO	NO
BRAND C	NO	NO	NO	NO	NO	NO	NO	NO
BRAND M	NO	NO	NO	NO	NO	NO	NO	NO
BRANDP	YES	YES	NO	YES	NO	NO	NO	NO
BRAND S	NO	NO	NO	YES	NO	NO	NO	NO
BRAND T	YES	NO	NO	NO	NO	NO	YES	NO

Full emulation of all other clocks. Yes, we emulate Brand A, Brand T, Brand P, Brand C, Brand S and Brand M too. It's easy for the H.O. to emulate other clocks, we just drop off features. That's why the H.O. can emulate others, but none of the others emulate us. The Timemaster II H.O. will automatically emulate the correct clock card for the software you're using. Of course most programs will use the Timemaster II H.O. in its native mode, but it's comforting to know that you won't have to worry about compatibility problems. You can also give the H.O. a simple command to tell it which clock to emulate. This is great for writing programs for those poor unfortunates who bought some other clock card.

REMOTE CONTROL

Our BSR X-10 interface option for the H.O. allows you to remotely control up to 16 lights and electrical appliances through your BSR X-X-10 home control system in your home or office. You're already wired because a BSR system sends its signals over regular 120 volt wiring. That means you can control any electrical device in your home or office without additional wiring.

CLOCK PRICE $129.00 **BSR Option (may be added later) $49.00**

VIEWMASTER 80™

There used to be about a dozen 80 column cards for the Apple. Now there is only ONE.

- TOTALLY Videx Compatible.
- Perfect for any APPLE II, II+ or IIe.
- 80 characters by 24 lines, with a sharp 7x9 dot matrix.
- On-board 40/80 soft video switch with manual 40 column override.
- Fully compatible with ALL Apple languages and software—there are NO exceptions.
- Low power consumption through the use of CMOS devices.
- All connections are made with standard video connections.
- Both upper and lower characters are standard, with true descenders.
- All new design (using a new Microprocessor-based C.R.T. controller) for a beautiful razor sharp display.
- The VIEWMASTER incorporates all the features of all other 80 column cards, plus many new improvements.

	PRICE	BUILT-IN SOFTSWITCH	LOW POWER DESIGN	80 COLUMN HOME	7X9 DOT MATRIX	LIGHT PEN INPUTS	40 COLUMN OVERRIDE	INVERSE CHARACTERS
VIEWMASTER	139	YES	YES	YES	YES	YES	YES	YES
SUP'RTERM	MORE	NO	NO	NO	NO	NO	YES	YES
WIZARD 80	MORE	NO	NO	NO	YES	NO	YES	YES
VISION 80	MORE	YES	NO	NO	YES	NO	NO	NO
OMNIVISION	MORE	NO	NO	NO	NO	NO	YES	YES
VIEWMAX 80	MORE	YES	NO	NO	YES	NO	NO	YES
SMARTERM	MORE	YES	NO	NO	NO	YES	YES	NO
VIDEOTERM	MORE	NO	YES	NO	YES	YES	NO	YES

The VIEWMASTER 80 works with all 80 column applications including CP/M, Pascal, WordStar, Format II, Easywriter, Apple Writer II, VisiCalc, Dollars and Sense, and all others. The VIEWMASTER 80 is THE MOST compatible 80 column card you can buy at ANY price!

PRICE $139.00

Z-80 PLUS™
Now Includes New 4.0™ Software

Enter the CP/M world with the new Z-80 Plus card from Applied Engineering and introduce your Apple to thousands of new programs. Only the Z-80 Plus comes standard with the new 4.0 software, the most advanced system for running CP/M programs ever. Only CP/AM 4.0™ has advanced features like built-in disk emulation for popular memory expansion boards (those made by Apple and Applied Engineering and others) to give you a faster system with more storage. You also get menu driven utilities that are much easier to use than the older CP/M utilities so you can get down to all that great CP/M software faster. The Z-80 Plus runs older CP/M programs too, down to Version 1.6 (2.2 is the most popular). With the Z-80 Plus you can run the largest body of software in existence, and the Z-80+ is the only card on the market capable of accessing more than 64K in an Apple IIe. If you have an extended 80 column card, all 128K is usable, and if you have Ramworks, up to 1088K is available to CP/M. And each Z-80+ includes our CP/M Ram Drive software, enabling IIe owners to use an extended 80 column card, or a Ramworks card as an ultra-fast Ram disk enabling CP/M software to run 10 to 20 times faster. So fast acting software like WordStar, and dBASE II become virtually instantaneous! Simply plug the Z-80 Plus into any slot in your Apple. You'll have two computers in one and the advantages of both, all at an unbelievably low price.

- TOTALLY compatible with ALL CP/M software.
- Fully compatible with most hard disks including the Sider and Corvus.
- The only Z-80 card with a special 2K "CP/M detector" chip.
- Fully compatible with microsoft disks (no pre-boot required).
- Specifically designed for high speed operation in the Apple IIe (runs just as fast in the II+ and Franklin).
- Runs WordStar, dBASE II, Turbo Pascal, Fortran-80, Peachtree and ALL other CP/M software with no pre-boot.
- A semi-custom I.C. and low parts count allows the Z-80 Plus to fly through CP/M programs at a very low power level. (We use the Z-80B at a fast 4MHZ.)
- Does EVERYTHING the other Z-80 boards do, plus Z-80 interrupts.

PRICE $139.00

Our boards are far superior to most of the consumer electronics made today. All I.C.'s are in high quality sockets with mil-spec. components used throughout. P.C. boards are glass-epoxy with gold contacts. Made in America to be the best in the world. All products work in Apple IIe, II, II+ and Franklin. Applied Engineering also manufactures a full line of data acquisition and control products for the Apple; A/D converters and digital I/O cards, etc. Please call for more information. All our products are fully tested with complete documentation and available for immediate delivery. All products are guaranteed with a no hassle **THREE YEAR WARRANTY.**

Call (214) 241-6060, 9 a.m. to 11 p.m. 7 days a week or send check or money order to P.O. Box 798, Carrollton, Texas 75006. MasterCard, Visa and C.O.D. welcome. No extra charge for credit cards. Texas residents add 5⅛% sales tax. Add $10.00 if outside U.S.A.

APPLIED ENGINEERING
"We Set the Standard"

Circle 51 on Reader Service Card

MEMBER BILLBOARD

JULY 1985

Don Elman

Applesurance and //e Enhancement Kit

Members who upgrade their Apple //e with the new enhancement kit may experience problems at power-on if they have a Prometheus Applesurance disk controller card. The same problem appears when running our new Mach 3.5 card with Applesurance. The new 65C02 chip in practice has slightly different timing requirements than the venerable 6502—a change Prometheus could not have anticipated when Applesurance was designed. Ironically, the incompatibility is caused by a design adjustment Prometheus made to deal with the noisy data buss found on some revisions of the Apple II. But take heart—there is a fix. Contact Prometheus for the nominally-priced upgrade. Also note that Applesurance users will need the new 3.1 ROM for compatibility with the //e enhancement ROM's.

Communication—By Phone

As many of you know, our telephone switchboard is normally open for business calls between 8:30 A.M. and 4:00 P.M. on work days. In the past we have handled after-hours incoming calls in a variety of ways, ranging from an expensive answering service to just letting the phone ring and ring. Starting in July, we plan to put a phone answering machine on the main office line during non-working hours. If you call during those times, you'll hear a recording that gives answers to such commonly-asked questions as store hours. You may, of course, leave a message if you have urgent information to bring to our attention. Because we may not be able to respond immediately in every case, however, please make routine inquiries and other calls requiring a personal response during regular business hours.

Communication—By Mail

Written correspondence from members on any topic is always welcome. In fact, it is the most important feedback we have on what the organization is doing right—and where there is room for improvement. The bulk of our mail—which concerns such everyday matters as changes of address, membership information, and product orders—can be processed fairly quickly and routinely. A sizeable proportion of the letters, particularly those addressed directly to the President, may require a considerable amount of time in order to do the necessary research and construct a personalized reply. If you send a letter which falls in this category, we hope you understand why there may be a lengthy delay before you receive an answer, or occasionally a letter might get sidetracked in the process of searching for certain information. In any event, be assured that every letter is read and considered seriously upon receipt.

A.P.P.L.E. Consultants

'C'	Phil Pearson	(603) 362-4297
Accounting/B.P.I.	Mike Levinson	(713) 524-6747
Agriculture	Neil Clemmons	(314) 968-9618
Apple III (East)	Carmen Picardi	(603) 895-4447
Apple III (East)	Harry T. Hanson	(201) 467-0712
Apple III (East)	Stuart Yusem	(609) 822-9306
Apple III (West)	Bob Huelsdonk	(206) 542-7122
Apple IIe (EAST)	John Hall	(617) 241-9050
AppleWriter	Don Lancaster	(602) 428-4073
Applesoft	Leon Raesly	(301) 460-0754
Applesoft (Australia)	Graeme Samways	048-851-541
Appleworks	Ina Levinson	(713) 524-6747
Assembly Language	Don Lancaster	(602) 428-4073
Assembly Language	Scott Zimmerman	(801) 378-4100
Assembly/CP/M (East)	Dennis Baumgarte	(914) 856-3617
CP/M (Midwest)	Murray Arnow	(312) 878-0113
CP/M (West)	Kevin Talbot	(206) 232-7058
Data Bases	Steven E. Bair	(512) 699-0776
Data Bases/Business	Jerry Rogan	(319) 332-4166
DBASE/PFS	Leon Raesly	(301) 460-0754
DOS (East)	William P. Steinberg	(212) 921-0663
DOS (South)	Lee Meador	(817) 469-6019
DOS (West)	William Reynolds	(503) 472-4028
DOS/AppleSOFT (Europe)	Cornelis Bongers	31-010-525511 Ext.3275
Education	Ted Perry	(916) 485-1690
Geoscience	Tedd Sperling	(517) 393-1296
Handicapped Applications	Tom Deal M.D	(206) 634-2847
Hardware design,I/O control	Stan Axelrod	(415) 563-1840
Hardware Interfacing	Randy Halvorson	(206) 783-9040
Hardware (Australia)	Graeme Samways	048-851-541
Hi-Res	Ed So	(408) 267-3448
LISP	Frederick Naef	(703) 471-1479
Logo	Jeff Sandys	(206) 784-3317
Macintosh	Dan Stinson	(206) 242-2590
Macintosh (Midwest)	Tim Smith	(309) 734-7451
Mathematics	Stowe Keller	(804) 971-6876
Multiplan	Richard Schubert	(716) 352-0837
Music	Stephen F. Lee	(704) 876-3444
Pascal (East)	Tom Woteki	(202) 547-0984
Pascal (Midwest)	Tim Smith	(309) 734-7451
Pascal (South)	Garry Flemings	(205) 279-7474
Pascal (West)	Dennis R. Cohen	(213) 956-8559
Pascal (West)	Paul E. Sleeper	(415) 494-1915
Pilot	Earl Keyser	(612) 429-5570
Pilot	Randy Warrens	(608) 837-9566
ProDOS/APPLIIe	Cecil Fretwell	(319) 236-0961
Statistics/Educ	Rich Hoffman	(513) 529-5533
Stock Market	Robert Wood	(703) 893-9591
Video Interfacing	Jim Hockenhull	(509) 334-4137
Visicalc (East)	George L. Hefter	(617) 256 3082
Visicalc (North)	Vince Aderante	(312) 289-9685
Visicalc (South Africa)	Brian Abrahams	(Durban) 315442
Visicalc (South)	Dr. Bob Richard	(504) 466-0894
Word Processing	Leon Raesly	(301) 460-0754

Call -A.P.P.L.E. consultants are unpaid volunteers and perform a valuable service. Before placing a call, please make sure you know the time zone you are calling to. No calls after 9pm please. Sometimes a consultant will have you leave your name and number and later return your calls. In all fairness, please expect the return call to be collect. We are always looking for more consultants. If you see an area that needs coverage, please drop us a note c/o *Butch Greathouse* with your qualifications and availability.

New Products-A.P.P.L.E. Co-op

PRODUCT:
Maxwell's Demon
PRODUCT CODE:
SDEMON
INTRODUCTORY PRICE:
$30.00
(Through August 15th)
REGULAR PRICE:
$35.00
SHIPPING WEIGHT:
1 Lb.

Here is a unique de-bugging aid for the beginner and veteran assembly language programmer alike!

Maxwell's Demon will save the accomplished assembly language programmer hours of valuable time tracking down those obscure little bugs and fine-tuning assembly language code.

Beginners will find the powerful SINGLE-STEP feature and dynamic screen display invaluable for learning how to use each of the 6502/65C02 op codes and understanding the effect of each instruction on the internal workings of the microprocessor.

WHAT YOU SEE IS WHAT YOU GET

Maxwell's Demon operates in an INTERPRETIVE fashion, processing each instruction in your machine language program before it is given to the CPU. One of the many benefits to you is the ability to monitor on the screen, the results of each instruction as it is executed.

By SINGLE-STEPPING through your code (or any code in ROM for that matter) you can monitor the following CPU operations on MD's screen display:

1. See a disassembled listing of the five machine instructions surrounding the current Program Counter.
2. The current contents of the A, Y, and X Registers, the Program Counter, the Stack Pointer, and the Processor Status Register including the on/off condition of each of the flag bits in this register.
3. The number of machine cycles needed to execute the current instruction.
4. The total number of machine cycles used during program execution.
5. The total number of memory read and write cycles used.

IF YOU DON'T LIKE IT — CHANGE IT!

What happens if you do stumble across a "minor" flaw in your code?

Simply **UN-EXECUTE** the last instruction processed. **In fact, Maxwell's Demon allows you to single-step BACKWARDS up to 16 instructions!** Combine this with the ability to manually change the contents of virtually any location in memory including all registers, the status flags, and the stack, and it should quickly become apparent just how powerful Maxwell's Demon really is!

Other features include:

- Uses symbol tables created by Big Mac.C/MERLIN
- Single-step and full run/trace.
- Programmable trace mode speeds up execution.
- Break point handler sets breaks without physically altering object code.
- Mini-Symbolic assembler.
- Complete expression evaluator for numeric input. (allows symbols)
- Remapping option allows program to run anywhere in memory.
- Source code available for modification.
- Full support of the 6502 and 65C02 instruction sets.

PRODUCT:
SSD Pascal 1.2 Driver
PRODUCT CODE:
SPAS2
(II, II+, IIe)
PRICE:
$20.00
SHIPPING WEIGHT:
2 oz.

Solid State Disk (Flashcard) Pascal 1.2 Driver. This software lets Pascal 1.2 users take advantage of the speed inherent in the SSD memory-based disk drive emulator.

PRODUCT:
Anthology disk 13A (Jan - Mar '85)
Anthology disk 13B (Apr - Jun '85)
PRODUCT CODE:
SA13A, SA13B
(II, II+, IIe)
PRICE:
$12.50 each
SHIPPING WEIGHT:
1 oz.

Save yourself the trouble of typing in the programs which appear in the pages of Call -A.P.P.L.E. Consult the individual magazine issues for the corresponding articles.

PRODUCT:
MacBooster
PRODUCT CODE:
SMCBST
PRICE:
$45.00
SHIPPING WEIGHT:
1 Lb.

New from Mainstay, MacBooster helps put an end to watch-icon burnout. MacBooster aids the Macintosh File Manager by continuously monitoring disk access. Those files that are accessed most frequently are stored in a cache, or memory buffer. Each time Mac goes to the disk, MacBooster checks its cache to see if the needed file has already been requested. If it has, it will be in memory and the contents of the file are displayed immediately. If it has not, the file is added to the cache so it will be instantly available the next time it's needed. Easy to use. Simply tell MacBooster how much memory to allocate for its cache (up to 356K), which disk drives are to be monitored, and whether or not you want to see the dialog box each time MacBooster is loaded. Once configured, all you need to do is click the MacBooster icon and it's installed. Requires at least a 512K Mac.

ORDERING CHECKLIST

To speed all orders, please include:

1. Your Name as it appears in our records (same as on your mailing label)
2. Member number and expiration date
3. Complete STREET ADDRESS (**not** Box number — see explanation below)
4. Phone number to reach you by day if we have questions
5. Payment Including:
   - Handling charge if applicable
   - Domestic or Foreign Shipping Charges
   - Magazine Postage if applicable

   (Sorry, we do not accept COD or Purchase Orders on individual memberships)

Each item you order needs:

6. Complete product name (and version if there is more than one product of that type)
7. Product Code

SHIPPING ADDRESS: We normally ship products by United Parcel Service (UPS). Therefore, the shipping address on your order cannot be a post office box. You may specify a P.O. Box for orders weighing less than 8 ounces. You also may make special arrangements for shipping some items via US Mail, Air Parcel Post, or UPS Second Day Air.

DOMESTIC SHIPPING CHARGES

SHIPPING WEIGHT	COST
Up to 5 Lbs.	$ 2.00
5 - 10 Lbs.	3.00
10 - 15 Lbs.	4.00
15 - 20 Lbs.	5.00
20 - 25 Lbs.	6.00
25 - 30 Lbs.	7.00
30 - 35 Lbs.	8.00
35 - 40 Lbs.	9.00
40 - 45 Lbs.	10.00
45 - 50 Lbs.	11.00

UPS 2ND DAY AIR

WEIGHT NOT TO EXCEED	48 STATES A	HAWAII D
1 lb.	$3.00	$4.53
2 "	4.00	5.71
3 "	5.00	6.89
4 "	6.00	8.07
5 "	6.50	9.25
6 "	7.50	10.43
7 "	8.50	11.61
8 "	9.50	12.79
9 "	10.50	13.97
10 "	11.50	15.15
11 "	12.50	16.33
12 "	13.50	17.51
13 "	14.50	18.69
14 "	15.50	19.87
15 "	16.50	21.05
16 "	17.50	22.23
17 "	18.50	23.41
18 "	19.50	24.59
19 "	20.00	25.77
20 "	21.00	26.95
21 "	22.00	28.13
22 "	23.00	29.31
23 "	24.00	30.49
24 "	25.00	31.67
25 "	26.00	32.85

FOREIGN SHIPPING CHART

POSTAL TABLE	Zone I West Indies Central America, Columbia, Venezuela	Zone II All South American Countries (except in Table I), Europe, N. Africa	Zone III Asia, Mid East, S. Africa Australia and Pacific Islands
0-4 oz.	$ 1.51	$ 1.96	$ 2.41
4-8 oz.	2.13	3.04	3.95
8-12 oz.	2.75	4.12	5.49
12-16 oz.	3.37	5.20	7.03
16-20 oz.	3.99	6.28	8.57
20-24 oz.	4.61	7.36	10.11
24-32 oz.	5.85	9.52	13.19
2-3 lbs.	8.29	13.84	19.39
3-4 lbs.	10.73	18.16	25.59
Each additional ½ lb. over 4 pounds add:	1.22	2.16	3.10

CANADA SHIPPING RATES

0-4 oz.	$ .76
4-8 oz.	1.48
8-12 oz.	2.20
12-16 oz.	2.84
2 lb.	3.92
3 lb.	5.00
4 lb.	6.08

For weights over 4 lbs: $6.08 + $1.08 additional per pound.

CODE	PRODUCT	Shipping WT.	UNIT PRICE	Amount
1.				
2.				
3.				
4.				
5.				
6.				

Total Shipping Weight _____ **SUBTOTAL** _____

Washington residents add 8.1% sales tax _____

Total Shipping Cost _____

$3.00 Handling charge if order is under $25.00 _____

TOTAL AMOUNT _____

Mail to:
A.P.P.L.E.
290 S.W. 43rd St.
Renton, WA 98055
(206) 251-5222

Order

Date _____

Name _____

Membership No. _____

Expiration Date _____

Address _____

City _____

State/Country _____

_____

Zip _____

Phone _____

Social Security/ (for dividend payments) _____

_____

☐ **Check enclosed**

☐ **VISA**

Account No. _____

Exp. Date _____

☐ **Mastercard**

Account No. _____

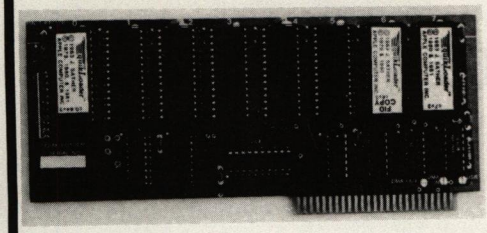
Exp. Date _____

Signature _____

SCRG PRODUCTS FOR THE APPLE COMPUTER

SOUTHERN CALIFORNIA RESEARCH GROUP

quikLoader™



designed by Jim Sather

- **Instantly** loads DOS.
- **Instantly** loads programs.
- Stores up to 512K of programs on **EPROM.**
- Stores and catalogs up to 255 programs.
- Directions included to load your own software (requires **EPROM** programmer card).
- Plugs into any slot of the APPLE][+ or //e.
- Uses standard 27 series **EPROM**s up to 27512.
- Allows turnkey operation.
- Commercial programs available.
- Includes **DOS, FID, COPYA,** and Integer.

The benefits of **quikLoader™** start when you turn on the computer. Standard DOS is *instantly* loaded . You may then catalog the programs available on the card by pressing **Q-reset**. Typing the index letter that appears on the left of the program name causes that program to be *immediately* loaded. We start your library of programs with the most popular utilities on **EPROM**, **FID** and **COPYA.** Now, if you have to copy a disk, you don't have to search for the master disk. You can start copying within **3** seconds after powering on.

Saving your own programs onto **EPROM** (**E**raseable **P**rogrammable **R**ead **O**nly **M**emory) is easily done, using a seperate **EPROM** programer, (such as the **PROmGRAMER™**). For APPLESOFT™, Integer, or single machine language files, no programming knowledge is necessary. You will need experience if you want to save copy-protected or complex programs. The amount of experience necessary depends on the complexity of the program.

SYSTEM REQUIREMENTS

The quikLoader plugs into any slot of the][,][+, or //e. If installed in a][+, a slightly modified 16K card in slot Ø is suggested. A disk drive is required to save data.

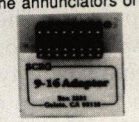
$179.50

DOS, Integer basic, FID, and COPYA are copyrighted programs of APPLE COMPUTER INC. licensed to SOUTHERN CALIFORNIA RESEARCH GROUP to distribute for use only in combination with quikLoader.

9-16 Adapter

For Apple //e and //c

This product permits the use of most 16 pin I/O devices with the APPLE //c or //e. By plugging this adapter into the sub-miniature 'D' connector, (in back of the computer), you can plug in a 16-pin device, such as the PADDLE-ADAPPLE, paddles, joystick, KOALA PAD™, etc. The only limitations are those devices that use the annunciators or the CØ4Ø strobe, such as the POWER PAD™. Please note that the //c does not support 2-joystick games.



$14.95

16-9 Adapter

For Apple][+ or //e

This product permits the use of all 9-pin game I/O devices with the APPLE][+. By plugging this adapter into the internal 16-pin connector, you can plug in any 9-pin game game device, such as paddles, joysticks, KOALA PAD™, Muppet Learning Keys™, etc.

$14.95

PROmGRAMER

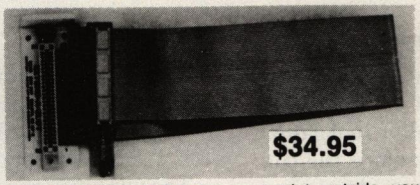
designed by Bob Brice — software by Bob Sander-Cederlof

The PROmGRAMER will read or program any of the standard single voltage EPROMS, from the 2708 to the 27512. Features include:

- Slot independent operation for the APPLE // family of computers.
- Zero-insertion force sockets accepts 24 or 28 pin devices.
- Choice of standard or fast programming algorithms.
- Disk-based software allows easy customization of software
- Source code included.
- Complete instructions for loading software into **quikLoader™.**

$149.50

EXTEND-A-SLOT

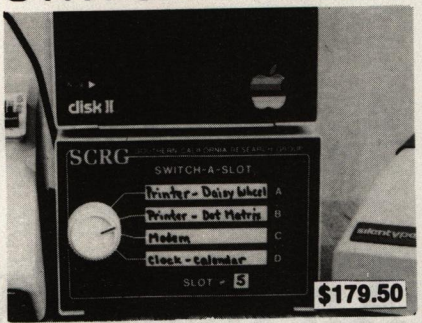


$34.95

The **EXTEND-A-SLOT** brings a slot outside your APPLE™, allowing an easy change of cards. The 18" flex cable is long enough to allow placement of the card in a convenient location. The high quality connectors are gold plated for reliability.

EASY TO USE—just plug it in as you would any expansion card, then plug your card in. When you want to change cards, do it easily outside the computer, without the wear and tear on the computer expansion slot.

SWITCH-A-SLOT



$179.50

designed by Joy George

The **SWITCH-A-SLOT** is an expansion chassis, which allows the user to plug in up to four peripheral cards at one time. One of these cards is selected for use, and only that card draws power.

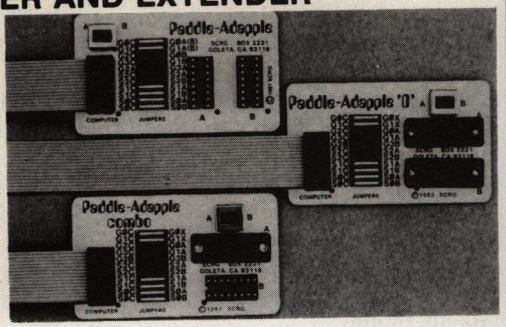
This product is especially useful where the software requires the printer to be in a particular slot, and the user wishes to choose between two or more printers.

- User selects desired card by front panel rotary switch.
- Plugs into any peripheral slot
- Saves wear and tear on delicate connectors.
- 18" cable connects SWITCH-A-SLOT to computer.
- Resistive terminations for better response.

SWITCH-A-SLOT and EXTEND-A-SLOT work well with most slow to medium speed cards, such as Modems, Printers, Clock, 80 Column, Music, etc. They are not recommended for high speed data transfer devices such as disk drive controllers, alternate processor, and memory cards. We cannot guarantee that these products will work with a particular system. We do have a money-back guarantee if it does not work for you. The SWITCH-A-SLOT is not recommended for use with the APPLE™ Mouse.

Paddle-Adapple

GAME I/O ADAPTER AND EXTENDER



- Works with all APPLE™ compatible joysticks, paddles, and most other I/O devices.
- Select one of two devices or...
- Use two joysticks simultaneously
- Suggested for **One-on-One™**, **Archon™**, etc.
- Unique "JUMPERS" socket allows you to configure to meet your needs.
- Plugs into internal 16-pin game I/O port.
- Small and compact. Adhers to computer with supplied foam tape.
- All strobes, annunciators and power available on all 16 pin sockets.
- Supplied with 18" cable.

$29.95

The **PADDLE-ADAPPLE** has two 16-pin sockets.

The **PADDLE-ADAPPLE 'D'** has two 'D' sub-miniature connectors.

The **PADDLE-ADAPPLE COMBO** has one 16-pin socket, and one sub-miniature connector.

SLOT 3 CLOCK

for APPLE //e and enhanced //e. **NEW**

designed by Chuck Shaffer

- Fully supports **PRODOS™** . •Applesoft™ compatible.
- Designed for slot 3 (usually otherwise unusable).
- Time and date-stamp files under PRODOS.
- Long-life lithium battery included.
- Includes software.

$79.50

Available at your local dealer or direct from:

So. Calif Research Group
P.O. Box 593-L
Moorpark, CA 93021
(805) 529-2082
TELEX 658340 ATTN: SCRG
Answer Back INTERTEL SNC
VISA, MASTERCARD accepted

Add $2.50 for shipping. Outside U.S. and Canada. $5.00, for surface, $10.00 Air; except Switch-A-Slot, $25.00 Air.

SIX MONTH WARRANTY
TEN DAY RETURN PRIVILEGE
TOLL-FREE ORDER LINES

in CA (800) 821-0774

(800) 635-8310

all other states (Including AK, HI, VI & PR)
Information & technical questions: (805) 529-2082

OTHER PRODUCTS

D MANUAL CONTROLLER: Gives complete control over the $CØØØ through $CØFF range in hardware. Think of it as a hardware switch for soft switches. Can be switched while program is running. **$89.50**

MAGIC KEYBOARD (for][or][+ only) Re-encodes the keyboard to give alternate keyboards, such as DVORAK, A.S.K., 10-KEY, HEXADECIMAL KEYPAD, etc. **$49.50**

Circle 75 on Reader Service Card

Apple Computer Incorporated: An Inside View

Quincy Flugelheidt

Well, we're going through another reorganization at Apple Computer. Not that that's anything new; at the Corporate, Divisional or Section/Group level, some kind of reorganization has been going on almost continuously since the company was founded. The organization charts at Apple have been a joke for years: you can't keep them up to date. The organization and reporting relationships have been, well, fluid.

The Big Announcement in June was that co-founder and Chairman Steve Jobs was finally out of power. The newspaper and magazine press played up the story and the conflict between Steve and President John Sculley. From the inside, however, it wasn't all that much of a surprise; the big question was when, not what.

The official story is that Apple Computer is going from two product divisions (Macintosh and Apple II) and corporate/support staff to an Operations Division and a Marketing Division, with Corporate/support staff. As of the time we turned this report over to **Call-A.P.P.L.E.**'s Cupertino office (deadlines, they tell us), all of the puzzle pieces had not been fitted into place.

Before the switch, Del Yocam was running the Apple II Division and Steve Jobs was running the Macintosh Division. The June news was that Steve Jobs would *not* be running one of the new divisions. In fact, Steve was being placed in a long-range "global" visionary position, in which nobody would report to him.

The Marketing Division will be headed by Bill Campbell, who had been brought in from Kodak by John Sculley. Bill had been supervising Apple sales, and was building a large internal sales department to replace the network of independent representative firms that Apple had had before. Just before this Reorg, a reorg over there had some 200 sales people being laid off as Apple reduced its National Accounts effort.

Under this latest Reorg, the Operations Division will have responsibility for all product development and manufacturing. Marketing will handle sales and sales-related activities. That will effectively eliminate the rivalry that had been going on between the two divisions. It will create new and different rivalries, most likely in the area of marketing input to product development.

Mac vs. Apple II

There is a valid management theory called "creative conflict", in which top management pits two or more teams against each other in in-house competitions. The result can be beneficial for the company, provided the conflict doesn't get out of hand. Some companies, like Procter & Gamble, organize so that some of their products compete with each other. The winning managers advance, the losing managers evaporate. Apple Computer went to the product division structure through the back door about 15 reorganizations ago, when the Personal Office Systems (POS) Division was created for the Lisa as a separate unit. That made sense; Lisa was a totally different machine than the Apple II, for a different market, etc. Besides, John Couch and his crew were working on Lisa as a top-secret project. Security helped dictate separation.

The Personal Computer Systems Division (PCS) was the Apple II - Apple /// division. PCS was then, and Apple II was later, the larger division, and the company's moneymaker. Between 60 and 80 per cent of Apple's sales and profits come from the Apple II product family.

Some kind of conflict became inevitable the day that Steve Jobs walked in and took over a group that Jef Raskin had been running. They were developing the Macintosh, and soon there was a Macintosh Division, in its own building, and with its own rules. Those guys quickly became Apple's elite, and made sure everybody knew it. They got to drink Chablis, while the rest of Apple drank Pepsi. When the Chairman of the Board is the division manager, nothing stands in its way. An example is the Apple ///. The ///, it seems, was killed ultimately because it was price-competitive with Macintosh. Nothing stood in Macintosh's way.

Since the Macintosh runs with a 68000 chip, like Lisa, it wasn't too long before the Mac and Lisa divisions were consolidated . . . under Steve. Within 48 hours of the new manager's first "communications meeting" (that's an Appleism for "get the troops together, make them feel they're participating, and tell them how it's going to be"), it seemed that every headhunter in Silicon Valley had a bunch of resumes from people—good people—from the old Lisa division. Too bad they didn't have the LaserWriter then; the resumes being run off around Apple these days look a lot better.

The Macintosh-Apple II conflict was inevitable because the two machines were closer competitors than Lisa and the Apple II had been. To the Apple II people, it seemed that every Apple II product improvement was being judged by the Exec Staff on the basis of whether or not it would hurt the Mac. If it might, then let's not improve the Apple II.

More recently, Apple has positioned the Macintosh as a business machine, and the Apple II as a home/education machine. Well, Apple has more than half of the education market, so we're not hurting there. The problem is that the Apple policy did not allow for promotion of the Apple II as a business machine, in spite of all the business software available. The Apple II could be and is being used very well for business, but to say so would get in the way of the Mac.

That's the kind of thing that had Steve Wozniak upset, along with the whole Apple II division. The infamous January 1985 Macintosh stockholders' meeting was the last straw for him and many others. Steve and John ignored 80 per cent of their company. About March, the press began carrying stories about people leaving Apple. The Official Word was that nothing unusual was going on; that some people always left for better opportunities, and good luck to them, etc.

But at that time, the market was down enough that there just weren't that many good opportunities lying around. After about July 1984, after the reorg that followed the //c introduction, if you asked why someone was leaving, the answer was not "I got this great opportunity," but, "I've had it up to here." That was new. It was also serious enough that Mike Markkula and the Board of Directors had to become concerned about the management here. John Sculley later owned up to a "failure of leadership". Whether he was asleep at the switch, or awake but waiting for the right moment to correct "The Stevie Problem", only he can say.

Trouble

Now, you can't blame Steve for protecting his division. And if the Macintosh had done as well as the forecasts, he would have been untouchable. Frankly, we're not sure that the trouble was in the performance. It was more likely in the forecasts. If there's one place where Apple is weak, it's forecasts. Not just that they're overoptimistic, but they often miss the market sense if the Exec Staff "knows better". Example: Production of //c monitors was based on the premise that 60 per cent of the //c buyers would want the little white monitor. Some research showed more, but 60 per cent was decided on. Somewhere. Well, the number turned out to be 80 per cent. //c's went begging and the dealers were yelling for more monitors.

Even worse was the blindness that insisted that the //c would outsell the old //e. It didn't and there was a backlog of orders for //e's that took four months to work off.

Creative PR

When the April one-week plant closing was announced, to work off inventory after a low sales quarter, the financial analysts and reporters fell on Apple with knives drawn. There was shock, because up to then the Apple PR machine (said to be the best machine Apple ever made) was grinding out endless rosy scenarios. The press even then swallowed the hype, though.

Here are two instances. First, the report was that about 24,000 Macs had been sold in a month, as against a plant capacity of 40,000. But back when the Mac was introduced, the plant capacity had been given at over 70,000. It seems that you can minimize a difference by counting only one shift instead of two.

Then there was the story that Apple had never laid off people before. Well, we have been talking about reorgs in this report. Almost every reorg has resulted in fewer slots in the company, and some people being given 30 days to find a place or get out. Apple has had layoffs all along. A guy about three cubicles over said it best: "The difference between Apple and Atari is that Atari announces its layoffs."

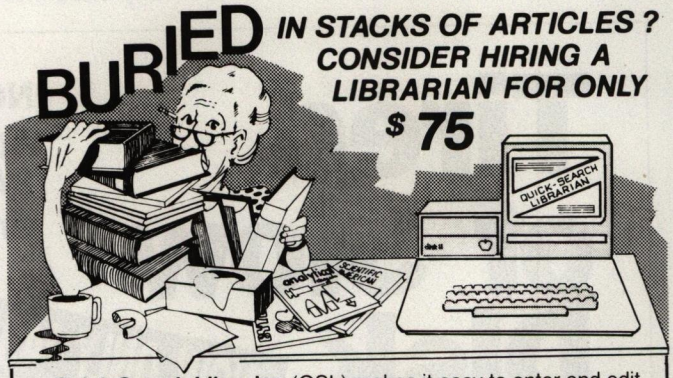
You could see in the press reports that Apple's troubles were gleefully pounced upon by reporters and Wall Street types who felt that they had been surprised; that Apple hadn't leveled with them. Apple now has the job of rebuilding that trust.

Apple's PR had always been excellent up to then. As one former division manager put it, "Any time you can sell 50,000 copies of a computer (Mac) for which only three pieces of software exist, that's first-class hype."

The Employment Hype

Nobody has been hyped at more than Apple employees. The Human Resources (that used to be "Personnel") advertising talks about "being a revolutionary" and "changing the world". The Sacred Pitch was that Apple was somehow not like ordinary companies, but was a Corporate Nirvana. To the extent that people swallowed that line and came to Apple for less money, Apple pulled off a coup. (Obviously *Sculley* didn't swallow it, judging from his paycheck.) But after a while of working nights and weekends, and hearing more and more about how others had been zapped in a thoughtless Reorg after working nights and weekends, the rosy glow dissipates.

People who were leaving Apple in late '84 and '85 said that management wasn't looking for brains and participation; they were looking for people who will do what they're told. The new employees don't believe that yet. When the *Wall Street Journal* covered the personnel exodus problem earlier this year, there were many arguments in the company about whether the article was accurate or not. Some of us noticed that the people who thought the article was a bad one, and



Quick Search Librarian (QSL) makes it easy to enter and edit your journal references, search for articles, and print or sort a list of articles using the APPLE* II+/IIe computer. Important QSL features include:

- Two keystrokes select any one of 255 keywords or any one of 255 journal titles.
- Four lines available for listing authors, title and/or comments.
- Powerful data base screen editing, copying and merging features.
- Average search speed is 50 articles/second with multiple criteria; average sorting speed is 40 articles/second when sorting on 3 fields.
- Typically, 1000 articles can be stored on a single disk.
- Includes sample data base and tutorial for *Scientific American* magazine.

VISA or Mastercard orders accepted. QSL manual available separately for $5. (Price of manual deductible later with purchase of QSL software.) Add $2.50 for shipments made in U.S.A.

Telex: 705250 *Trademark of Apple Computer, Inc.

INTERACTIVE MICROWARE, INC.
P.O. Box 139, Dept. 48
State College, PA 16804 (814) 238-8294

Circle 66 on Reader Service Card

that Apple was better than that, had been with Apple less than a year. Those on the scene for more than a year, however, thought the article was right on.

Demoting Steve Jobs is causing sighs of relief among those who felt that he was a jerk, and was hurting the company. But Apple's problems go beyond his situation. One middle manager in this building described it as like being a dog on a chain in the back yard. You know when you get near the end of the chain, it's time to slow down because you don't want to hurt your neck. But at Apple, the length of the chain is changed at random every day. After a while, you move slowly *all* the time, because you don't want to risk your neck.

We're in the middle of another round of layoffs—pardon me, reorgs, now. The best news is that as the idea that Apple is somehow more than just another business firm fades away, the pleasanter it becomes to be in Cupertino. The press focused on the crumbling of an edifice; but did the edifice in fact ever exist? We're seeing the first signs of Apple management actually levelling with its people, and we hope that continues. The new organization seems to have some good folks at the helm, with less nonsense.

That remains to be seen, of course. But Jean-Louis Gassee is generally known to have cleaned up Apple France's act. The public word was that he was coming to the United States at Sculley's "request", to head up Macintosh marketing; he's now in charge of all product development, under Yocam. A manager with a marketing orientation can't hurt there.

Of course, the talk is of layoffs. The first press reports were that up to a thousand people were on the block. "Up to" is a nice reporter's phrase, covering any number from 1 to 1000. It's likely to be a lot less than 1000. Some of this is natural: with a unified structure, you don't necessarily need two documentation (excuse me, "user education") managers, two advertising coordinators, two software developer relations groups, etc.

For a good many people in Apple, the change is seen as positive—even overdue. Sure, many resumes are out. Mine isn't. I'm also thinking it may be time to buy some Apple stock again. And if I could figure a way to sell tickets to this circus, I'd be rich. Meanwhile, I'll watch the fun.

(**Note:** "Quincy Flugelheidt" is not the name that appears on the author's Apple badge.)

Ed. note: This article was written against the backdrop of major readjustments within Apple Computer that were announced during May and June of this year. The most public part of the picture includes the wholesale corporate restructuring outlined above, consolidation of manufacturing facilities, falling stock prices, and significant "trimming" of staff (at latest count reaching even larger numbers than the author suggests).

Whether this shakeup bodes well or ill for the future of Apple is perhaps a matter of personal interpretation. Some might view it as the last gasps of an upstart company that never quite succeeded against its giant, three-lettered competitor. Others see it as the necessary, desirable signs of maturation for a company that has established a permanent niche in America's high technology development. Only time will tell for sure.

What are the implications for current Apple owners? As active users, your opinions about these changes are very important. Please let us know what you think in the form of letters to the editor, and we'll print a representative sample of your comments in later issues.

Tired of Slow Disk Response?

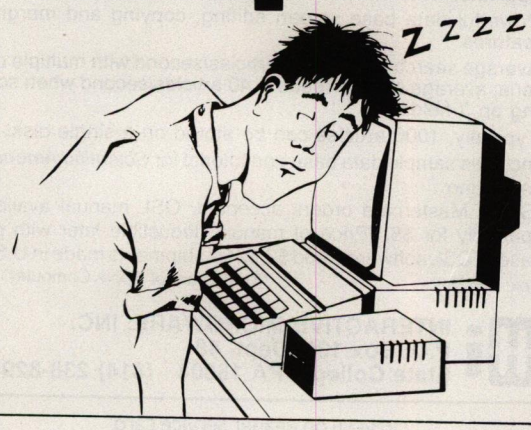
NO MORE NAPS while waiting for your Apple disk drive to respond! Axlon's RAMDISK™ 320 cuts the disk response time of your Apple II or III by over 90%.

NOW ONLY $495 was $695

Your Apple sees the RAMDISK 320 as two regular disk drives. But YOU see the lightning-fast system performance of a mainframe.

Whether imitating two separate drives or acting as one double-sized drive, the RAMDISK dramatically increases productivity of all operations — CATALOGing, word processing, accounting, sorting, assembling, copying, etc.

- Internal power supply doesn't burden your Apple. A separate three hour battery backup system is provided.
- Increases your Apple's memory by 320K!
- Software included! Software drivers for compatibility with DOS 3.3, SOS, CP/M, Pascal 1.1 and 4.0. Demonstration database programs: 200 entry phone log, 3200 record directory. DRAWING BOARD II, a digitized drafting system for schematics and other CAD-type drawings.
- Your CP/M™ card and software (WordStar, dBase, etc.) will process data even faster. Compatible with Softcard, Softcard IIe, & Apple III.
- Slot-independent interface card for Apple II, II+, IIe, or Apple III.
- AXLON is passing along to its customers the falling cost of RAM by reducing the cost of the RAMDISK 320 from $695 to $495!



SO WAKE UP! And stop using your Apple for a pillow! Order your RAMDISK 320 from:

AXLON®

408 747-1900
1287 Lawrence Station Rd.
Sunnyvale, California 94089

Circle 55 on Reader Service Card

Floating-point Arithmetic in Applesoft BASIC

The Apple Numerics Group has been working for several years to implement state-of-the-art numerics on all Apple computers. The result of these efforts is called SANE, for Standard Apple Numerics Environment. It is available for Pascal and assembly programmers on Apple II and III computers, and is the native arithmetic on Macintosh. AppleWorks, MacPascal, MacBASIC, the Lisa Workshop, and several other Macintosh languages and application programs use SANE.

This article, which identifies several of the problems in Applesoft arithmetic, was written 3 years ago by Jim Thomas while a student at the University of California, Berkeley. Jim is now the head of the Apple Numerics Group, which includes Kenton Hanson and Clayton Lewis. We are indebted to Clayton for bringing the article to our attention.

James W. Thomas

Many people are no longer surprised to find their computers executing:

```
S = 0
FOR I = 1 to 1000
S = S + 0.1
NEXT
PRINT S
```

and not printing 100. They realize that computer arithmetic is in some ways different from the arithmetic they learned in mathematics classes. The typical computer user will attempt to ignore these discrepancies, proceed as if dealing with ordinary (real) numbers, and then acknowledge that his results may contain some "insignificant" roundoff error. The user may know that for some computations, a computer's arithmetic fails to produce usable results. He may believe this happens only for contrived problems, or only for people with unusually bad luck. If his program fails to obtain results, or if he recognizes his results contain significant errors, he still may not suspect computer arithmetic as the culprit.

The expert, the numerical analyst or the scientific programmer, is less naive. In his circles there is active concern about the manner in which computers do arithmetic, evidenced by the 1981 IEEE Proposed Standard for Binary Floating-Point arithmetic (*which became IEEE Standard 754 in April 1985 and is the basis for SANE -Ed.*) Partly because of the aforementioned attitudes among naive users, computer designers have exercised great liberty with the nature and quality of their machines' arithmetics. The resulting peculiarities are many and varied (7). The more irregular the arithmetic, the more difficult becomes the programmer's job in programming around trouble areas and in verifying program correctness. If portability of program is desired, the difficulty increases accordingly. (In light of growing software costs, these concerns are more than aesthetic.)

Of course arithmetic irregularities affect the non-expert's programs too. Since he may not undertake an extensive proof of correctness, he may be spared the task of programming around trouble areas spotted in the analysis. Then, however, he may have results whose accuracy is eroded by the arithmetic to an extent completely unknown. On the other hand, if the arithmetic produces errors which do attract his attention, either in output or in other unintended program behavior, and if he suspects the computer arithmetic as the culprit, then the non-expert may still have enormous difficulty in debugging without acquiring a detailed knowledge of his machine's particular arithmetic.

In this article, we discuss some of the peculiarities of Apple II Applesoft BASIC, a floating-point arithmetic which is widely used by non-experts. In the section entitled Architecture, we summarize the architecture of the arithmetic; under Irregularities we present and discuss several behavioral irregularities; and under Implications we assess the implications the architecture and irregularities hold for the users.

Architecture

Floating-point numbers are represented in memory using five bytes (40 bits). The first byte is an 8-bit exponent which includes a bias of 128. The high order bit of the second byte is the sign bit. The remaining 31 bits are used with an implicit high-order 1 bit to make a 32 bit significand. Representation is signed magnitude. Thus

8	1	31
exp	s	significandbits

represents $(-1)^s \times 2^{exp-128} \times .1significandbits$. Zero is represented whenever exp is 0, regardless of the significand bits. Valid representations range from 2^{-128} (actually 2^{-128} is invalid in some cases—then 2^{-127}) to $2^{127} \times (1 - 2^{-32})$, or roughly 10^{-38} to 10^{38}. The 32 bit significands can distinguish between nine decimal digit significands.

While arithmetic operations are carried out, operands may have an additional *guard byte,* giving a significand of 40 bits. In addition and subtraction, both operands and the result use guard bytes. In multiplication, the multiplier and the product use guard bytes. In division, only the quotient has extra significance, but just 1 bit. When addition, subtraction, or multiplication is initiated, one operand has a 32 bit significand and the other a 40 bit significand. Although both operands in addition and subtraction use guard bytes, the operand with the 32 bit significand does so only if it has the smaller exponent, shifting its significand right. In formula evaluations involving several operations, the sizes of the significands depend on the order of the operations as well as on the operations themselves. Intermediate operands with 40 bit significands may be rounded to 32 bits and pushed onto a stack, or not, depending on the details of the formula.

Rounding consists of inspecting the high order bit of the guard byte and, if a 1 is found, incrementing the higher order 32 bit significand. Thus rounding is to the nearest value with ties going away from zero. Numbers are normalized before rounding, except when an addition or subtraction cancels the high order 32 bits but leaves a non-zero guard byte. Then the result is set to zero. In addition to stack pushes by formula evaluation, memory stores also are preceded by rounding. Divisors are rounded before divisions occur. The guard byte has no sticky bit, so that any 1's shifted out the right of the guard byte are lost.

Overflow results in an OVERFLOW ERROR message and termination of the program. Underflows are set to zero.

Irregularities

By irregularities we mean behavior of the arithmetic which the user should not be expected to anticipate. Such behavior may occur intentionally, because of design decisions, or unintentionally, because of bugs. Actually the distinction here is not clear-cut because design decisions often are made to live with presumably insignificant or tolerable bugs.

Formula-evaluation design flaw. Intermediate operations may present different results to subsequent operations, depending on the positions of the operations in the formula.

Example (non-commutative addition):

```
]LIST

10  A = 2↑(-2) + 2↑(-3) +
      2↑(-33)
20  A = -A
30  B = 2↑(-1) + 2↑(-32)
40  C = 2↑(-1) + 2↑(-2)
50  PRINT A + B * C,B * C + A

]RUN
0                    1.16415322E-10
```

This phenomenon occurs as a direct consequence of the design of the formula evaluation routine. For A+B*C the result of B*C stays in a floating-point accumulator, unrounded and with guard byte. For B*C+A the result of B*C is rounded and stacked. Hence different numbers are added to A in the two cases. The following is similarly explained.

Example (non-commutative multiplication):

```
]LIST

10  A = 1-2↑(-31)
20  B = 2↑(-33)
30  C = 2↑(-1)
40  PRINT C + (A + B) * C - A
50  PRINT C + C * (A + B) - A

]RUN
4.65661287E-10
2.32830644E-10
```

The remedy here would involve nontrivial design decisions. Two obvious approaches are i) including the guard byte on the stack and ii) rounding operands before operations occur. Alternative i) requires modification of the addition, subtraction, and multiplication routines which now use operands with different size significands.

Evaluator-comparator conspiracy. In comparing two numbers for =, <, or >, the propagation of carries from a guard byte beyond the low order byte is not considered. Thus A op B = A op B may be false, since the formula evaluator rounds and pushes one A op B result onto the stack but leaves the other A op B result unrounded in the floating-point accumulator.

Example (non-reflexive equality):

```
]LIST

10  A = 2↑(-1)
20  B = 2↑(-24) - 2↑(-33)
30  IF A + B = A + B THEN PRINT
      "A+B=A+B"
40  IF A + B > A + B THEN PRINT
      "A+B>A+B"

]RUN
A+B>A+B
```

Either remedy suggested above in the "Formula-evaluation design flaw" section would correct this flaw. A fix not involving the formula evaluator must compare a rounded number with a non-rounded number as if the latter were rounded. This appears to require some code.

Sign-of-small-quotient bug. If the exponent of a quotient is -128, then a positive quotient will result regardless of the signs of the divisor and dividend.

Example ((A/2)/A = -.5):

```
]LIST

10  A = -(2↑(-127))
20  PRINT A,(A/2)/A

]RUN
-5.87747176E-39      -.5
```

In division, the exponent of the divisor is negated and added to the exponent of the dividend. If the result including its bias is zero, then control branches to an underflow routine in order to produce a zero quotient. The zero exponent already indicates zero, so the underflow routine simply sets the sign to "+". But then the return is back into the division routine which increments the exponent to account for a shift and carries out the division, so the result is no longer zero. It appears the underflow should not have been signaled, since the result is good except for the sign.

Multiplier bug. When two consecutive bytes of the multiplier are 0, the accumulated product bits to that point will be shifted one place too far to the right.

Example (1*A ≠ A):

```
]A = 2↑(-1) + 2↑(-24) - 2↑(-31)

]B = 1*A

]CALL -151

*803.809

0803- 41 00 80 00 00
0808- 00 FE

*80A.810

080A- 42 00 80 00 00 00
0810- 7F
```

Note that the low order byte FE of A becomes 7F in B = 1*A, a shift of one bit to the right. The error can be as large as 127 units in the last place of the binary significand. With A as in the example A*1 yields A, so the multiplication bug produces non-commutative multiplications. With a slight modification, the example violates A>1 → A*B>B(B>0). This bug could be easily exterminated by resetting a carry which is cleared by a special routine which handles the zero byte multiplication.

Attempting a clearer demonstration of the effect of the multiplication bug, we continue with the preceding example.

```
]PRINT A,B : REM B = 1*A
.50000003            .500000015
```

But hand conversion of the binary representations shows that A and B differ by approximately 30 in the ninth decimal place. The effect of the multiplication bug is confounded by the following.

Binary → decimal conversion error

Example:

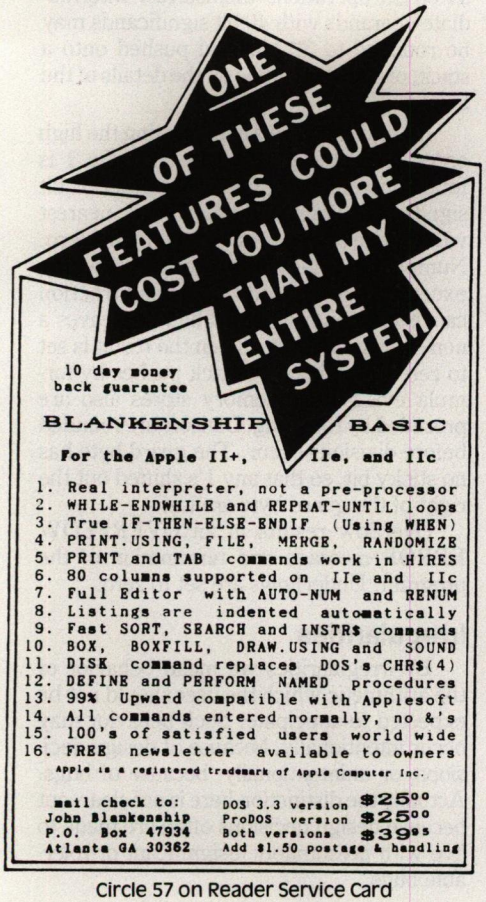
```
]A = .500000059

]CALL -151

*803.809

0803- 41 00 80 00 00
0808- 00 FD
*

]PRINT A
.500000029
```



ONE
OF THESE
FEATURES COULD
COST YOU MORE
THAN MY
ENTIRE
SYSTEM
10 day money
back guarantee
BLANKENSHIP BASIC
For the Apple II+, IIe, and IIc
1. Real interpreter, not a pre-processor
2. WHILE-ENDWHILE and REPEAT-UNTIL loops
3. True IF-THEN-ELSE-ENDIF (Using WHEN)
4. PRINT.USING, FILE, MERGE, RANDOMIZE
5. PRINT and TAB commands work in HIRES
6. 80 columns supported on IIe and IIc
7. Full Editor with AUTO-NUM and RENUM
8. Listings are indented automatically
9. Fast SORT, SEARCH and INSTR$ commands
10. BOX, BOXFILL, DRAW.USING and SOUND
11. DISK command replaces DOS's CHR$(4)
12. DEFINE and PERFORM NAMED procedures
13. 99% Upward compatible with Applesoft
14. All commands entered normally, no &'s
15. 100's of satisfied users world wide
16. FREE newsletter available to owners
Apple is a registered trademark of Apple Computer Inc.
mail check to:
John Blankenship
P.O. Box 47934
Atlanta GA 30362
DOS 3.3 version $25.00
ProDOS version $25.00
Both versions $39.95
Add $1.50 postage & handling
Circle 57 on Reader Service Card

The internal binary representation of A is correct to all 32 binary places, so the decimal-to-binary conversion has done its job well. Since $2^{-32} < 2.4*10^{-10}$ the binary number in the example is nearer to .500000059 than to .500000058 or .500000060. Hence we might expect the conversion decimal-to-binary-to-decimal to be the identity on .500000059. However we obtain an error of 30 in the ninth decimal place! The conversion routines use the floating-point arithmetic and so are subject to the errors therein. Perhaps the multiplication bug, via multiplications in the binary-to-decimal conversion, causes the surprisingly large error above.

Trigonometric function error. The sine function exhibits extremely poor accuracy near zero.

Example (sin(A)/A is not near 1 when A is small):

```
]LIST

10   FOR I = 1 TO 12
20   A = 10↑(-I)
30   PRINT A, SIN (A) / A
40   NEXT

RUN
.1                .998334166
.01               .999983334
1E-03             .999999833
1E-04             .999999995
1E-05             .99999994
1E-06             .999998797
1E-07             .999984511
1E-08             .99975593
1E-09             .997184394
9.99999998E-11    0
9.99999999E-12    0
9.99999999E-13    0
```

The sine function is identically zero for arguments greater than $.5*10^{10}$.

Example (sin(A) = 0 for large A):

```
]LIST

10   FOR I = 5 TO 12
20   A = 10↑I
30   PRINT A, SIN ( A )
40   NEXT

]RUN
100000            .0356574928
1000000           -.349137508
10000000          .41642956
100000000         .914209756
1E+09             .707106781
1E+10             0
1E+11             0
1E+12             0
```

The flaw in the sine routine lies in its argument reduction. The argument is divided by 2*pi and F, the fractional part of the quotient, is obtained. As the first step of determining the quadrant, F is subtracted from ¼ and the difference is the basis of all further calculations. If F is small, ¼ – F has little or no significance. If the original argument is large, the fractional part of its quotient by 2*pi is zero.

The cosine and tangent functions are obtained through the identities

$$\cos(x) = \sin(x + pi/2)$$
$$\tan(x) = \sin(x)/\cos(x)$$

and hence inherit the errors in the sine functions.

Example (tan(A)/A<1):

```
]LIST

10   FOR I = 1 TO 12
20   A = 10↑(-I)
30   PRINT A, TAN (A) / A
40   NEXT

]RUN
.1                1.00334672
.01               1.00003334
1E-03             1.00000033
1E-04             1
1E-05             .999999941
1E-06             .999998798
1E-07             .999984543
1E-08             .999755933
1E-09             .997184394
9.99999998E-11    0
9.99999999E-12    0
9.99999999E-13    0
```

Trigonometric identities are not reliable.

Example ($\sin(A)^2 + \cos(A)^2 \neq 1$):

```
]LIST

10   FOR I = 5 TO 12
20   A = 10↑I
30   PRINT A, SIN (A)↑2 + COS ( A)
       ↑2
40   NEXT

RUN
100000            1
1000000           1
10000000          1
100000000         .982226087
1E+09             1.35355339
1E+10             0
1E+11             0
1E+12             0
```

Example ($\sin(2*A) \neq 2*\sin(A)*\cos(A)$):

```
]LIST
10   FOR I = 5 TO 12
20   A = 10↑I
30   PRINT SIN ( 2 * A ),2 * SIN ( A ) *
       COS (A)
40   NEXT

]RUN
-.0712696343      -.0712696343
-.654333618       -.654333618
-.757208846       -.757208846
-.740951125       -.699705854
1                 1.30656297
0                 0
0                 0
0                 0
```

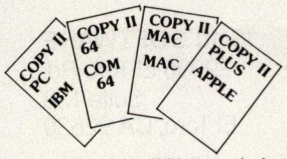

BACKUP PROTECTED SOFTWARE with COPY II PLUS™ ver. 5

From the team who first brought you **COPY II PLUS** in 1981 comes a completely updated disk backup utility for your Apple // computer. New features include:

- **Fully automatic bit copy*.** All parameters are stored on disk. Simply type in the name of the program you wish to backup, and **COPY II PLUS** does the rest!
- **New utilities** including Alphabetize Catalog, Fast 2-pass Disk Copy on a //c or //e, and an all-new Sector Editor.
- **Supplied on a standard DOS** diskette. Runs on the Apple //, Apple //+, Apple //e, Apple //c. Requires 64K and one or two disk drives.

Increase the power of your Apple //...
Use **COPY II PLUS™ 5.0**

Call M-F 8-5:30 (W. Coast time) with your VISA MasterCard : **503/244-5782.**
Or send a check (add $3 s/h, $8 overseas) to



$39.95

CENTRAL POINT Software, Inc.
9700 SW Capitol Hwy. #100
Portland, OR 97219

* We update Copy II Plus regularly to handle new protections; you as a registered owner may update at any time for 1/2 price! (To update, just send original disk and $20.)

This product is provided for the purpose of enabling you to make archival copies only.

Circle 58 on Reader Service Card

COMPUTEREYES™

VIDEO IMAGES ON YOUR APPLE!

Finally — an inexpensive way to capture real-world images on your Apple's Hi-Res display! COMPUTEREYES™ is an innovative slow-scan device that connects between any standard video source (video tape recorder, video camera, videodisk, etc.) and the Apple's game I/O socket. Under simple software control, a b/w image is acquired in less than five seconds. A unique multi-scan mode also provides realistic grey-scale images. Hundreds of applications!

Package includes interface module, cable, complete easy-to-use software support on disk, owner's manual, and one year warranty. For 48K Apple II series and compatibles, with Applesoft and DOS 3.3. COMPUTEREYES™ is available from your dealer or direct from DIGITAL VISION for just $129.95 plus $4.00 S&H (USA).

Also available as a complete package including:
- COMPUTEREYES™
- Quality b/w video camera
- Connecting cable

for only $349.95 plus $9.00 S&H.

Demo disk available for only $10.00 postpaid.

Mass. residents add 5% sales tax. Mastercard, Visa accepted. To order, or for more information, write or call:

Screen dumps of actual COMPUTEREYES™ images.

Now also for Apple IIc!

DIGITAL VISION

DIGITAL VISION, INC.
14 Oak Street — Suite 2
Needham, MA 02192
(617) 444-9040

Circle 62 on Reader Service Card

Even if the sine's argument reduction were repaired, the cosine would perform poorly for large arguments, x, because pi/2 would have little or no effect in x + pi/2. The simple repair for the trigonometric functions is to replace the module with an implementation of good existing algorithms.

Implications

The examples in the preceding section point to several areas in which the arithmetic's behavior is other than a programmer would expect. This behavior is caused by subtle workings of the arithmetic routines (intentional or unintentional), the understanding of which would prove a heavy burden for the non–expert programmer.

- The programmer may have less accuracy than the 32 bit significance with rounding to nearest plus guard bytes for intermediate results would lead him to believe. The binary–to–decimal conversions and the multiplication bug may produce single operation errors of 30 in the ninth decimal place. The trigonometric functions may produce results with no significance. The guard byte provides extra accuracy only for rather special formulas which avoid the rounding stack pushes. The guard byte does not facilitate the significance one would hope for when addition or subtraction cancels the 32 high order bits, because such results are set to zero.
- The most innocent algebraic manipulations of formulas may alter a program's results. Virtually every axiom of real numbers can fail (maybe not 0 + x = x). The compilation of a usable set of rules on which a programmer could depend would be very difficult.
- Branch tests may be difficult to control. The sign–of–small–quotients bug may reverse a sign. The formula evaluator may produce a zero for an expression which elsewhere appears to be non–zero. The comparator–evaluator conspiracy may provide incorrect comparisons. The loss of accuracy mentioned above may affect comparisons. Thus the unwary programmer's tests to separate cases or guard against invalid operands may be sabotaged.

Although the irregularities discussed in this paper appear simple to correct (with the possible exception of the formula evaluation flaw), Apple Computer Inc., will be reluctant to implement changes. The Applesoft BASIC was purchased from Microsoft and no one with Apple is truly familiar with the details of the code. The code has little modularity, so it is difficult to assess the ramifications of changes. Multitudinous software exists for the current version and it would be difficult to check that these programs still run.

On the other hand, with the increased interest in arithmetic among the experts and with the increased knowledge of computing among the general population, the number of users who are aware of anomalies in the arithmetic can be expected to increase. More users will pursue the possibility that errors in their results are caused by computer arithmetic.

References

1. *Apple II Reference Manual.* Apple Computer Inc., 1979.
2. *Applesoft BASIC Programming Reference Manual,* Apple Computer Inc., 1978.
3. IEEE Subcommittee p754, "A Proposed Standard for Binary Floating–Point Arithmetic," Draft 8.0, *Computer,* 14, 3, March 1981, pp 53–62.
4. Camp, Smay, Triska, *Microprocessor Systems Engineering,* Matrix Publishers Inc., 1979.
5. Coonen, J.T., "Accurate, Economical Binary - Decimal Conversions," May 1981.
6. Kahan, W., "Error in Numerical Computation," Course Notes, 1963.
7. Kahan, W., "Why Do We Need A Floating–Point Arithmetic Standard?", March 1981.
8. Luebbart, W.F., "What's Where in the Apple," *MICRO – the 6502 Journal,* August 1979.

Life in the Fast Lane, Slow Lane or Any Lane...

...is expensive when it comes to your car! A typical driver can spend $1000 or more on fuel per year driving 15-20,000 miles at 20 miles per gallon. Driving with a dirty air filter, low tire pressure and other problems can add $100-200 to fuel costs, plus higher repair bills and decreased reliability!! Minimizing those costs means keeping your car in top condition and spotting problems early. Using CAR-TRAK, your APPLE II can eliminate the guesswork from preventative maintenance and help avoid unnecessary repairs and fuel costs. CAR-TRAK is two programs in one! A SERVICE SCHEDULER reminds you of inspection and service requirements by date and mileage for up to 50 items per car. A PERFORMANCE ANALYZER graphically highlights suspicious changes in fuel consumption which may signal early trouble, and provides a number of SUMMARY REPORTS to help with business expenses, income taxes, and billing verification. It's simple and easy to learn and use! Put your APPLE II to work for you. Order CAR-TRAK by CHECK or M.O. for $39.95 plus $2.00 shipping and handling. (CA residents add $2.40 sales tax.)

CAR-TRAK requires II+, //c or //e w/48K.
APPLE is a trademark of APPLE Computer, Inc.

10/10 SOFTWARE
22996 El Toro Rd.
Suite 138
El Toro, CA 92630
(714) 380-1063

Circle 76 on Reader Service Card

SANE Programming on the Apple

Product:	Standard Apple Numerics Environment (SANE)
Use:	Numeric Calculation
For:	Apple II, ///, Pascal
Company:	Apple Computer Inc.
Includes:	Documentation and disk
Availability:	Apple Computer Dealers
Price:	$35

J. B. Koons

MORE and more often now we hear that the day of the lowly 8 bit microprocessor, such as the 6502 that sits at the heart of all Apple II and Apple III computers, is over. If you want to do real work you need a machine with one of the new 16 or 32 bit wonder chips. Well, don't you believe it!

With the right software, the Apple II and III can still perform like the troopers they are. And Apple has a new software utility that proves the point once again. It's called Standard Apple Numerics Environment (SANE). Hence the bad pun in the title. If you need to do high precision math then you need this package.

The package reviewed here runs under the Apple II and Apple III Pascal Systems and is provided as a set of three units for use with Pascal programs. Several other versions are also available. These include a version for use with 6502 assembly language, running under the Prodos operating system, and versions for use on the Macintosh and Lisa computers.

SANE implements the IEEE Standard 754 for Binary Floating Point Arithmetic. The requirements for this standard, and thus for SANE, are truly outstanding: the Extended Arithmetic type provides in excess of 19 decimal digits in the mantissa and a range from 10^{-4932} to 10^{+4932}.

According to the documentation, this package supports all the features of the draft standard with the exception of rounding precision. The package is said to have been completely validated by test procedures developed by members of the Standards Committee.

There are four data types which may be used by an application. These are Single, Double, Extended and Comp. Single, Double, and Extended are data types defined in the proposed standard while Comp is an additional type defined by the SANE package. Comp values are integer variables of up to 19 decimal digits (63 bits). Regardless of the storage type used by an application all calculations are performed using the extended type to retain maximum possible accuracy. Extended data values use a 64 bit mantissa and a 16 bit exponent.

Most work will probably be done using single or double precision types. These types require less storage than the extended type and their use allows for guard bits in the actual calculations, performed with the extended type.

The double precision routines allow in excess of 15 decimal digits (53 bits) in the mantissa and a decimal exponent range of +/–308. All operations are performed by means of procedure calls. For instance, to solve for the hypotenuse of a right triangle the following program segment might be used. Assume that X, Y and H are double precision and that the two temporaries, T1 and T2 are Extended types.

This is considerably less convenient than standard infix notation. However, when the high precision provided by this package is required, use of separate procedure calls to evaluate an expression is still much simpler than writing your own floating point math routines!

To gain some idea of the speed of SANE in comparision to standard Pascal and Basic arithmetic, I performed timing tests on some simple calculations. Each calculation was performed separately in a loop. The time to run an empty loop was then subtracted from this total and the resulting time was divided by the loop count to obtain a time per calculation value.

```
D2X(X, T1);          { convert X to extended T1 }
D2X(Y, T2);          { convert Y to extended T2 }
XPWRI(2, T1);        { square T1 }
XPWRI(2, T2);        { square T2 }
ADDX(T1, T2);        { T2 <-- T1 + T2 (X↑2 + Y↑2) }
SQRT(T2);            { T2 <-- SQRT(T2) SQRT(X↑2 + Y↑2) }
X2D(T2, H);          { store answer in H }
```

The results of these tests are shown in Table 1. The tests were timed by hand using a watch with a sweep second hand. The intent is to provide a guage of relative times for the various computations and languages, rather than specific figures that can be taken as gospel. In comparing these figures, remember that BASIC calculates to 9 digits, and standard Pascal to 6 digits while all computations are carried to 19 digits in SANE.

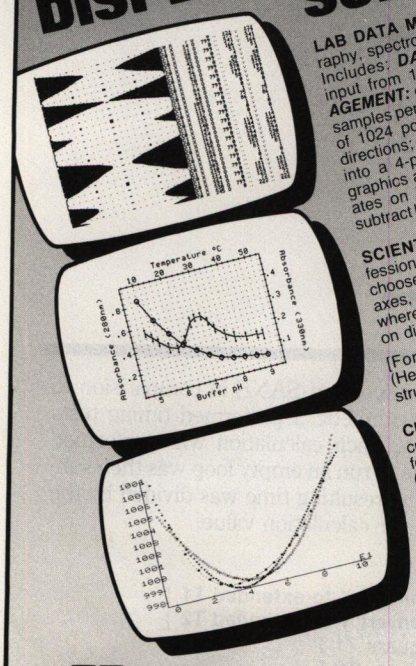
Separate SANE units are provided for the II and III computers. These units include procedures for addition, subtraction, multiplication, division, square root, comparision (<, > =, =, etc.), remainder or modulo, negation, absolute value and rounding of values.

A full set of routines for converting from external fixed or floating point formats to internal binary form and back is also provided. Especially noteworthy in this regard is the fact that you can enter input values and receive results directly in scientific notation. For instance the distance of the earth from the sun, 93 million miles, could be entered as 93E6.

The third unit, the Elems unit, provides a set of procedures for evaluating trigonometric and other functions with high precision. The Elems unit requires the presence of the appropriate SANE unit. The functions provided include log (bases 2 and e), ln(1 + x), 2^x, e^x, $e^x - 1$, x^y, sin(x), cos(x), tan(x), and arctan(x). Procedures for working with compound interest and annuities and a random number generator are also included.

When using these units on an Apple II 64K system, they must be installed in the SYSTEM.LIBRARY and the library must be online in the boot drive. If you have an Apple IIc, or a IIe with an extended 80–column card, the units can be placed, instead, in a Program Library File for use with the 128K Pascal system. In either case, these are large units. If the units are placed in the SYSTEM.LIBRARY, you may find it useful to create a version of the SYSTEM.LIBRARY that contains only these units and any others which are required by a given applicaion. A library that contains only the SANE and Elems units requires 60 blocks of disk space.

APPLE*II DATA ACQUISITION DISPLAY & PLOTTING SOFTWARE



LAB DATA MANAGER software for chromatography, spectroscopy and many other applications. Includes: **DATA ACQUISITION:** samples A/D input from 1 to 16 channels; **MEMORY MANAGEMENT:** extra RAM cards can store up to 32K samples per channel; **FAST DISPLAY:** 4 data sets of 1024 points with zoom and scrolling in 4 directions; **STRIPCHARTS:** turns your printer into a 4-pen chart recorder that prints both graphics and text; **DATA PROCESSING:** operates on large data sets; e.g., differentiate, subtract baseline, integrate peaks. **$250**

SCIENTIFIC PLOTTER — Draws professional-looking graphs of your data. You choose data format, length and position of axes, 20 symbols, error bars, labels anywhere in 4 orientations. Includes 5 demos on disk plus 30-page manual **$25**

[For DIF file or plotter adaptations (Hewlett-Packard, Apple, Houston Instrument) add $25 for each option.]

CURVE FITTER — Select the best curve to fit your data. Scale, transform, average, smooth, interpolate (3 types), LEAST SQUARES fit (3 types). Evaluate unknowns from fitted curve. Includes 5 demos on disk with 33-page manual . . **$35**

ORDERING INFO — Add $2.50 shipping on all U.S. orders. VISA or MASTERCARD orders accepted.
*Trademark of Apple Computer, Inc.

Write, call or Telex for our latest catalog!

INTERACTIVE MICROWARE, INC.
P.O. Box 139, Dept. 48, State College, PA 16804
Phone: (814) 238-8294 • Telex: 705250

Circle 67 on Reader Service Card

Table 1: Relative Speeds of Computation

Test	Sane	BASIC	Pascal
A * B	14	5	3
C * D	19	---	---
SIN(PI/6)	217	26	31
EXP(6)	256	26	32
ATAN(.5)	327	40	98
H = SQRT(A↑Z + B↑Z)	149	138	45

All times are in milliseconds. In comparing measurements remember that SANE calculates to 19 digits, BASIC to 9 and Pascal to 6.

A = 123456789E10 **B = 987654321E5**
C = 123456789E2000 **D = 987654321E2000**

This package is well designed and produced. If you need the functions it provides, it should return big dividends for a small investment. While the use of individual procedure calls is not as convenient as standard infix notation, it is now possible to work to a much higher precision than has ever been possible before on microcomputer.

The SANE package is provided on a single disk that is not copy protected. As we have come to expect from Apple Computer Inc., the documentation is complete and detailed; 90—7x9 inch pages punched for insertion in a special Apple Workbench three-ring binder. The spacing of the holes does not match that of the standard 8.5x11″ format. If your dealer does not have the Workbench binders in stock, a binder designed for 6x9 inch material makes a workable, if less perfect, substitute. When this smaller binder is closed, the manual page projects beyond the binding about a half an inch. SANE is available for $35. from Apple dealers.

A version of this review has previously appeared in Access, *a publication of LEDS Publishing Co.*

PROGRAMMERS: New DAVID-DOS II™

HIGH-SPEED DOS 3.3
DOS-MOVER/FAST-GARBAGE

Makes high-speed disk access under all conditions. DOS-mover frees 10,000 bytes of extra memory for programs. FRE command does ultra-fast garbage collection. Clock or manual disk dating. May be licensed.

100 Sectors in 7 Seconds

Speed Load/Save Applesoft, Binary & Integer 100 sector programs in 7 seconds. Tload/Tsave Random & Sequential Text Files at same speed. Speeds up programs like Home Accountant.

10K More Memory

Use HIDOS command in hello program for turnkey startup, adding 10K free memory to run 30% larger Applesoft programs than Pro-DOS. Moves DAVID-DOS II and 4 buffers above main memory.

Ultra-Fast Garbage

New FRE command collects a memory full of 6000 strings that are half garbage in two seconds. DOS 3.3 takes 12 minutes. FRE is so fast it is not noticeable during run of most programs.

Clock Dating

Automatic date stamping of disk files is set up for 6 kinds of clocks or Hello manual date entry. New DATE command will auto-insert date in correspondence.

All times in seconds. (Time Test programs available)		DAVID DOS-II	ProDOS	DOS 3.3
TEXTFILES (100 Sectors)	TSAVE	8.0	NO	NO
	TLOAD	6.2	NO	NO
(791 Strings, 32 chars ea)	WRITE	29.3	28.0	88.4
	READ	24.3	16.3	83.8
	PRINT/READ	44.2	45.9	117.1
(442 Sectors, 7 x 500)	APPEND	142.3	142.9	1231.2
APPLESOFT (100 Sectors)	*SAVE	6.4	16.4	33.1
	LOAD	5.0	4.0	23.5
INTEGER (100 Sectors)	*SAVE	6.6	NO	33.4
	LOAD	4.9	NO	23.4
BINARY (100 Sectors)	*BSAVE	7.3	18.4	28.7
	BLOAD	5.8	4.8	24.5
48K PROGRAM SPACE (With 3 Bufs avail)	APPLESOFT	36,352	NO	36,352
	INTEGER	36,352	NO	36,352
	BINARY	36,352	34,816	36,352
64K PROGRAM SPACE (With 4 Bufs avail)	APPLESOFT	46,592	32,256	35,756
	INTEGER	46,592	NO	35,756
	BINARY	46,592	41,728	35,756

*Add 5 seconds for Verify. Apple II, Applesoft & ProDOS are trademarks of Apple

Ten New DOS Commands

1. HIDOS moves DOS above 48K memory.
2. FRE makes ultra-fast garbage collection.
3. DATE stamp files. Clock or manual dating.
4. TLOAD speed loads all Text Files to mem.
5. TSAVE speed saves Text Files from memory.
6. TLIST lists all Text Files to screen/printer.
7. DUMP Binary/Ascii to screen or printer.
8. DISA disassembles Binary to screen/printer.
9. AL prints program Address & Length.
10. / is a one keystroke Catalog.

Identical Operation

All new commands operate identical to old DOS commands on the keyboard & in programs.

Install in Three Seconds

Install DAVID-DOS II on your full disks in three seconds without touching the programs. Create bootable high-speed new disks with a Basic, Binary, or Exec Hello & 35/40 tracks. Create Data-Disks with 30 extra sectors.

Variable Speed Scrolling

Key operated variable speed scrolling for TLIST, DUMP and DISA. Lower-case accepted on all commands. Catalog shows Free-Space. Automatic support of Integer or Applesoft Card in any slot, while in HIDOS or LODOS. Vendor license includes protection system.

Compatible

All DOS entry addresses have been preserved. DOS is same length and compatible with most software. David-Dos is fully copyable. Init areas were used for David-Dos. Works with all Apple IIs including IIe, IIc, Franklin & Basis with 48K/64K/128K & Corvus & Xebec Hard Disks. Complete documentation and many utilities are on the disk.

Add $2.00 Shipping. Overseas add U.S. $4.00. Calif. add 6%. **$39.95**

To Order: Send Check or Phone Visa/MasterCard.

DAVID DATA™
12021 WILSHIRE BLVD., SUITE 212A
LOS ANGELES, CA 90025 (213) 478-7865

Circle 61 on Reader Service Card

The Secrets of Apple Writer's WPL — Part 2

Richard Loggins

In the previous article in this series, we looked at the basic components of a WPL program. This month, we'll introduce variables, subroutines, and take a preliminary look at user interface. Our goal will be to provide a WPL program that will let you select a file from any disk and print as many copies as you desire—all automatically.

Variables

WPL supports two types of variables, string and numeric, both which exist in every other high level language. While this may not be earth-shattering, WPL does impose some rather unusual constraints upon them.

To begin with, only four string variables are supported, represented by **$A, $B, $C,** and **$D**. (If you have experience programming in BASIC, be sure to notice the position of the $ symbol—it must appear *before* the letter, not after.) Each variable can contain a maximum of 64 characters, and can be manipulated much the same as any other string variable.

Information is assigned to the string by using the **PAS** (Passing String) command as shown in Figure 1.

Command	String	Contents
PASGood=$A	$A	Good
PAS =$B	$B	*$B contains a space*
PASDay=$C	$C	Day
PASAB$C=$D	$D	Good Day

Figure 1 – String Variable Assignments

Now, before you skim lightly through this with the attitude of "there's nothing new here", allow me to point out a few key items that can be a source of immense irritation if overlooked.

First, notice the absence of quotation marks one usually associates with assigning text to strings. Second, you don't see any spaces (typesetters willing) in any of the assignments with the exception of the second ($B). Finally, the concatenation of strings does not require the "plus" symbol usually found in programming languages.

Where numeric variables are concerned, only integers in the range of zero to 65,535 are allowed. As with string variables, three letters (**X, Y,** and **Z**) have been predefined. Furthermore, only addition and subtraction are supported, and numeric variables can only be tested for an absolute "equal/not equal" condition: you cannot test for greater than, less than, greater than or equal to, etc.

The manipulation of numeric variables is accomplished with one command for assignment and math operations, and another for comparisons. Since the command used for comparisons is the same command used with string variables, we'll cover only the assignment command now and pick up the comparison command a bit later.

Command	Variable	Before	After
PSX 3	X	0	3
PSY 4	Y	0	4
PSZ (X)	Z	0	3
PSZ +6	Z	0	9
PSY -2	Y	4	2

Figure 2 – Numeric Variable Assignments

The five commands shown in Figure 2 do not demonstrate all the possibilities of assigning numbers to numeric variables. They do, however, demonstrate the basic methods for assigning specified values (first two commands), the number contained in one variable to another variable (third command), addition (fourth), and subtraction (fifth).

Of significance here is that: (1) the space has no effect on numeric variables, (2) parenthesis must be used when assigning the value of one variable to another, and (3) addition and subtraction are limited to single items. For example, **PSX 2+3** won't put 5 into X, but will result in 23 being placed into the variable X (don't ask, just believe!).

Error Flag

Since no actual error is involved, perhaps *Error Flag* is not the best name. It is, however, the term used by the master

programmer himself (Paul Lutus, in case you don't know) for the description of comparisons. So for lack of a better title, we'll stick with what we have.

There are three basic types of comparisons that can be made while using WPL: string, numeric, and the comparison of a string to a value. In each instance, the result of the comparison will establish the condition of the error flag. If the comparison is valid (both items are equal), the error flag will be "set"; if not, it will be reset. (Think of this as the error flag containing a one if set, a zero if reset.)

The status of the error flag after a comparison will determine if the next command will be executed or ignored. If set, the next command is ignored or skipped. If reset, it will be executed. Examples of this are shown in Figures 3 and 4.

```
_PAShello=$A
_PCS/goodbye/$A/     Compares "goodbye" to $A contents.
_PSX 33              Error flag set; this line skipped.
_PSY 15              This line is executed.
```

Figure 3 – Invalid Comparison

```
_PAShello=$A
_PCS/$A/hello/       Compares $A to "hello".
_PSX 33              Error flag reset; this line executed.
_PSY 15              Program execution continues.
```

Figure 4 – Valid Comparison

Professional Handicapping Systems by Professor Jones

GLD. Thoroughbred "Gold" Edition™
A "Full" featured thoroughbred analysis designed for the professional and serious novice. **$159.95** complete

EGLD. Enhanced "Gold" Edition™
"Gold" Edition with complete Master Bettor™ system integrated onto the same disk. This powerful program will transfer all horses and scores to the bet analysis with a "single keystroke." (Master Bettor™ included) **$199.95** complete

GLTD. Limited "Gold"™
Enables **Professional Handicappers** to assign specific values to the racing variables "they" feel are important. Create program weight based on a particular track and fine tune it for **maximum** win percentage. This program is designed for "ease of use". The user needs **no programming experience.**
(contains Integrated Bettor™) **$299.95** complete

GD. Gold Dog Analysis™
The only professional dog handicapper on the market, includes:
1) Speed 2) Post Today 3) Kennel 4) Post Last 5) Distance 6) Condition 7) Running Style 8) Weight 9) All new internal weighting 10) NEW class indicator
If you are near a greyhound track, you can't afford not to use this program.
$149.95 complete (with integrated Master Bettor™) **$199.95**
Limited Dog™ $299.95

PPX. Professor Jones' Football Predictor, Prof. Pix™
Complete Football Analysis with **Data-Base.**
1) Overlays 2) Point Spreads 3) "Super Plays" 4) "Over/Under" bets 5) Data Base Stats 6) Holds "100" teams
Highest percentage of winners 1984
$49.95 complete **$99.95** with Data Base Management

MHH. Master Harness Handicapper™
Professional software designed to provide a thorough analysis of all trotter and pacer races in North America and Canada.
$159.95 complete with integrated Master Bettor™ **$199.95**

NBA. Basketball™
This data base managed analysis will provide the user with "ALL" betting situations while storing relevant information on the disk.
$99.95 complete w/Manual **$129.95** NBA/College Version

LOT. LOTTERY ANALYSIS™
Statistical comparison program designed to detech subtle patterns in winning lottery number.
$79.95 complete w/Manual **$99.95** with Lotto

BROCHURE AVAILABLE

IBM™ APPLE™ TRS-80™ CPM™ COMMODORE™

Prof. Jones
1940 W. State St.
Boise, ID 83702

VISA MasterCard

48 HR. FREE SHIPPING

CALL 208-342-6939

TERMS: FREE SHIPPING ALL SOFTWARE. Add $6.00 hardware / $6.00 C.O.D. / UPS Blue $6.00 / Out of Country $9.00 / ID Residents 4% / 3 weeks personal checks / Cash price only, add 2% Visa, MC / Prices subject to change.

Circle 72 on Reader Service Card

The error flag will also be set when any numeric variable is decremented to zero, providing the capability to construct loops in a program that will terminate after a predetermined number of times. This method (Figure 5) will be used to control the number of copies printed in this month's program.

```
loop_PSX 5           Sets X to 5
_PNP                 Prints a document
_PSX -1              Subtracts 1 from X. If X = 0, error
_PGO loop            flag is set and PGO loop is skipped
_PQT                 Ends the program
```

Figure 5 – Controlled Loop

While there are other uses for the error flag and additional comparisons that can be made, we'll leave the rest for another time.

Video Display

Whether you classify it as personal taste or a major component of user interface, maintaining a "clean" video display can certainly enhance your programs. In fact, AppleWriter has two separate video displays available: one for the text editor, another for WPL. (You don't actually have two, but it's much easier to understand if you make this assumption.)

There are three commands that affect your video display: one to turn off the text editor display (**PND**), one to turn the text editor display on (**PYD**), and one to clear the WPL display.

If the text editor display is turned off, everything that will appear on your monitor can be controlled by your WPL program. If it's turned on, you can see each of the commands in your program being executed. Thus, leaving the text editor display on can help you debug your WPL programs.

The command to clear the WPL display will depend upon the version of AppleWriter you are using. Each is a single control character, and is entered using the [V] option (embedded character command) of AppleWriter.

If you have the DOS 3.3 version, you'll use [L], which is entered by pressing CONTROL-V, CONTROL-L, and CONTROL-V. You should see an upper-case L in reverse video (inverse) on your monitor.

If you have the Apple /// version, use a CONTROL-BACKSLASH instead of [L].

If you have the ProDOS version of AppleWriter, you can use either method you prefer. (Yes, I know the manual doesn't say anything about the backslash. It's another undocumented feature.)

In all program listings, this command will appear as [L], so don't forget to use the [V] option or to change it if you have an Apple ///.

It's Your Choice

Once again, I find I have more to say than will fit into the generous space provided for this article. So we'll save the rest for next time, and leave you with a WPL program that will print any number (up to 65,535) copies of any text file. Remember to replace the underscore character with a space, and that it indicates the first space in each line.

The items shown in italics should not be entered as a part of the program, as they are included to provide you with information about its operation.

One last comment: make sure your document contains an embedded form feed command (**.ff**) at the end to keep each item on a separate page.

```
_PND
_NY
start_PPRL
_PPR
_PPR
_PIN Location of disk (i.e.; .D2/): =$A     See note 1.
_PPR
_PIN Name of file to be printed: =$B        See note 2.
_PPR
_PIN Number of copies to print: =$C         See note 3.
_PCS/$C/0/
_PGO quit
_PCS/$C//   No spaces between second and third slash marks.
_PGO quit
_PSX $C       Assigns number entered to X
_PAS$A$B=$D   Complete pathname assigned to $D
_PPRL
_PIN  Verify printer is ready, press RETURN to begin
_NY   Erases text editor
_L$D  Loads file to be printed
_PNP
_PSX -1   Decrements X to account for first copy
_PGO loop  Executed only if X was greater than one,
_PGO quit  otherwise, we end the routine.
loop_PCP   Continue Print used to allow for top margin.
_PSX-1     X is decremented once again,
_PGO loop  and back for the next one if more remain.
quit_PQT   Otherwise we end the program.
```

Notes:

1. If you are using an Apple/// or the ProDOS version of AppleWriter, enter **.D2/** for drive two or **.D1/** for drive one. If you're using the DOS 3.3 version, enter, **D1** for drive one or, **D2** for drive two, and see note 2 and the modification in Figure 6.

2. If you're using DOS 3.3, make no entry when asked for the location of the disk. When asked for the file to be printed, enter both the file name and drive designation (i.e., **TESTFILE,D1**).

3. Entering a value less than one or pressing RETURN will cause the program to terminate immediately. Do not enter negative numbers or numbers greater then 65,535. DO NOT include commas, decimal points, etc.

```
_PPR
_PIN Name of file to be printed: =$A
_PPR
_PIN Location of disk (i.e.; ,D1): =$B
_PPR
_PIN Number of copies to print: =$C
```

Figure 6 – Modification for DOS 3.3

And there you have it. Simply enter it into the text editor as you would a normal file, and save it on disk. To use it, press **[P]** from the text editor and enter:

[P]rint/Program: DO *filename*

Of course, *filename* indicates you should enter whatever you named the file when it was saved.

In the next article, perhaps we'll take a look at how you can set up a glossary command to automatically execute a WPL program that will save the current document, print it, extract the address, and put it on the envelope for you. Have fun.

Laing Electronics

10382 STANFORD AVE.
SUITE E-203
GARDEN GROVE, CA 92640
PHONE: (714) 534-4216

★ **HARDWARE FOR THE APPLE** ★

	LIST	YOUR COST
HAYES MICROMODEM //E (+ SMARTCOM)	329.00	224.00
HAYES SMARTMODEM 1200/300	595.00	468.00
ANCHOR SIGNALMAN MK12 MODEM	399.00	251.00
NOVATION APPLE CAT II MODEM	319.00	198.00
PCPI 6MHz APPLI-CARD (Z80 CP/M) (BEST Z-80 CARD FOR THE //E	375.00	263.00
MICROSOFT Z-80 SOFTCARD CP/M	345.00	219.00
VIDEX VIDEOTERM 80 COLUMN CARD (SOFTSWITCH, AND INV. CHAR SET)	319.00	199.00
VIDEX ULTRATERM	379.00	225.00
WIZARD GRAPHICS INTERFACE CARDS		
IPI INTERFACE	88.00	69.00
BPO 16K BUFFERED INTERFACE	179.00	129.00
ORANGE GRAPHICS INTERFACE CARDS		
GRAPPLER PLUS	145.00	109.00
BUFFERED GRAPPLER PLUS 16K	239.00	149.00
CCS 7711 SUPER SERIAL CARD (BEST CARD FOR MODEM WORK)	110.00	95.00
MICRO-SCI DISK DRIVES		
A2 APPLE COMPATIBLE	299.00	195.00
A2 DRIVE WITH CONTROLLER	399.00	249.00
A5 HALF-HEIGHT APPLE COMPATIBLE	310.00	205.00
A5 DRIVE WITH CONTROLLER	410.00	259.00
PANASONIC KX-P1091 PRINTER (WILL DO EPSON FX GRAPHICS)	499.00	286.00
KENSINGTON SYSTEM SAVER FAN	89.95	62.00
VISTA A800 8" DISK CONTROLLER	379.00	249.00
EIGHT INCH DUAL DISK DRIVE SUBSYSTEM WITH CONTROLLER, 2.4MB, SOFTWARE SUPPORT FOR DOS 3.3, APPLE PASCAL, AND CP/M (MICROSOFT SOFTCARD OR PCPI APPLI-CARD)	**1900.00**	**995.00**

★ **SOFTWARE FOR THE APPLE** ★

PFS: FILE, REPORT, GRAPH, OR WRITE (WRITE FOR //E, OR //C ONLY) EACH	125.00	74.00
THINK TANK (LIVING VIDEOTEXT)	150.00	87.00
DB MASTER VERSION #4 (STONEWARE)	350.00	175.00
MICROSOFT MULTIPLAN (APPLE OR MAC)	195.00	117.00
WORDSTAR WITH CP/M CARD (MICROPRO) (CP/M CARD IS PCPI APPLI-CARD)	495.00	294.00
SCREEN WRITER PRO (ON-LINE)	129.00	79.00
MICROSOFT FORTRAN-80 APPLE CP/M	195.00	117.00
ACSII EXPRESS PROFESSIONAL	129.00	79.00
FANCY FONT PERSONAL TYPESETTER FOR CP/M AND EPSON FX, RX, MX, GEMINI 10X/15X OR PANASONIC 1091	180.00	150.00

If personal check, allow **10 BANKING DAYS for CLEARANCE.**
Prices and specifications subject to change without notice.
Unless otherwise noted, **ALL PRICES are PLUS SHIPPING.**
SHIPPING & HANDLING — ADD $5.00 UPS SURFACE (DISK) DRIVES $7.50 — MONITORS $10.00 — PRINTERS $15.00
California residents add 6% Sales Tax.

VISIT OUR RETAIL STORE & SERVICE CENTER
12821 WESTERN AVE., SUITE E
GARDEN GROVE, CALIFORNIA 92641

Circle 68 on Reader Service Card

"THE WRITE CHOICE"!

THE PERSONAL WORD PROCESSING SYSTEM AND TYPING PROGRAM FOR THE APPLE II, II+, IIe or IIc

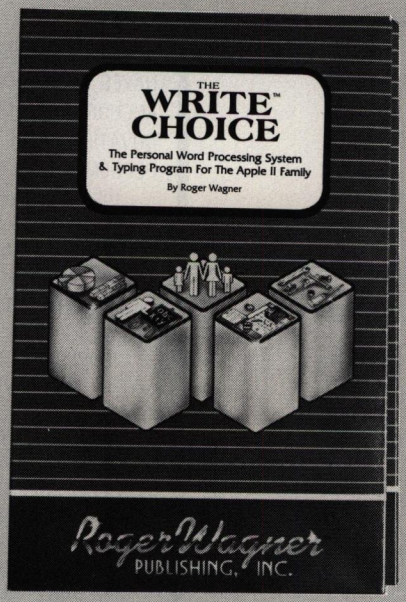
"THE WRITE CHOICE" is a unique software package for the Apple II family, which combines a full-featured **word processor**, a Hi-Res **typing instruction program**, and a **comprehensive documentation package** that instructs the user on the proper formats and appearance of written documents, punctuation rules and more!

"THE WRITE CHOICE" is ideal for family members new to computing, yet hard to outgrow because of its many features. THE WRITE CHOICE is also a favorite in schools because it is so easy to learn and offers such a wealth of reference information. Even experienced users appreciate the simple on-screen formatting.

THE WORD PROCESSOR

THE WRITE CHOICE word processor is easy to use for the beginner, yet has so many advanced features that it can grow with you. Just a few of these features include:

- "What you see is what you get" printouts; the screen displays the text exactly as it will be printed, plus **page breaks are displayed while you edit text**.
- Help commands that are available at all times. It's like having a built-in reference card.
- Cut and paste text anywhere in the document for quick and easy text editing.
- Search and Replace to correct any or all mistakes or errors.
- Document can be of any length; complete document can be searched for any word or group of characters.
- Underlining and full printer control with imbedded printer commands.



- When combined with The Printographer, you can even print Hi-Res graphics right in your documents.

THE ANALYST

THE ANALYST is a program that "reads" the documents you create and gives you a report showing the number of words used, the average word length, the readibility of your writing and the minimum grade level required to read your document. The numeric index is used by teachers and reading specialists to evaluate written material to assure maximum reader comprehension.

TUT'S TYPER

A combination keyboard tutorial and fun arcade game with Hi-Res graphics. Keyboard tutorial teaches fundamentals and proper typing technique. The game, "Tut's Tomb", is a fun way to develop your typing speed and accuracy. With 24 lessons in all, it keeps track of the last lesson, words-per-minute, and fast and slow keys for up to 25 different users.

TUT'S TYPER also supports the Dvorak keyboard option of the new Apple IIc with 24 specially designed lessons.

THE WORD PROCESSING STYLE MANUAL

The result of extensive research and compilation of accepted standards for letters, manuscripts, outlines, and reports, this is an invaluable guide to proofreading, capitalization, punctuation and much more. Many illustrations include sample letters, proper indentation and spacing for manuscripts, style guides for bibliographies and more.

Here's what people are saying about THE WRITE CHOICE:

"Fast, versatile, easy to use."
M.M., Los Angeles, CA

"When the price, $44.95, is considered, this may very well be the best software buy available today...."
D.L.Y., Fresno, CA

"I prefer the Write Choice to Applewriter IIe, which has been my favorite until now. I will also start teaching The Write Choice to a group of 5th graders, and I'm sure they'll be pleased to have such an excellent alternative to The Bank Street Writer."
J.R., Whitefish Bay, WI

"I sincerely believe The Write Choice is the best possible package for education...I think your program would meet the needs of the majority of Apple owners."
M.T., San Francisco, CA

UNLOCKED, COPYABLE AND HARD DISK COMPATIBLE

Introductory Price: $44.95 !

(PLUS! 30-DAY UNCONDITIONAL GUARANTEE)

Apple is a registered trademark of Apple Computer, Inc.

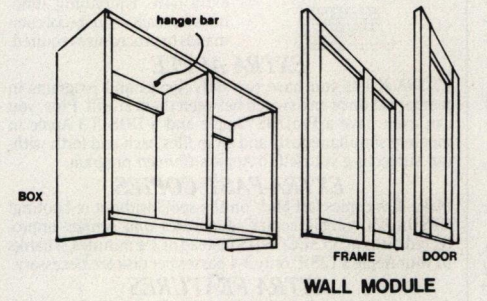
Roger Wagner™
PUBLISHING, INC.

Circle 73 on Reader Service Card

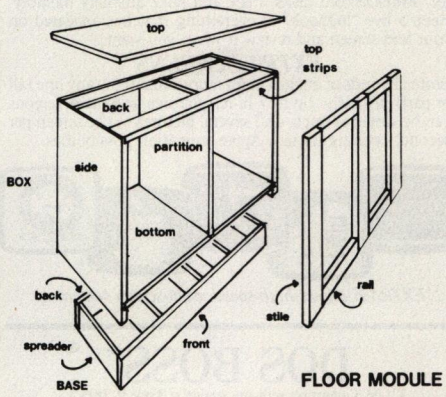
10761 Woodside Avenue • Suite E • P.O. Box 582 • Santee, CA 92071 • 619/562-3670

THE Spreadsheet as Cabinetmaker

John Geddis



WALL MODULE



FLOOR MODULE

A Cabinetmaking Primer

There are many of us "home improvement" types. In fact, I would say most homeowners have dealt in home improvement at one time or another. My latest opportunity to indulge in this pastime occurred as we added on to our house. It seemed like there was never enough storage space. At the same time, custom cabinet work (to provide the storage) cost more per square inch than almost any other kind of construction. Needless to say, I quickly schooled myself in the ways of cabinetry. I found that my main source of frustration was measuring. Too many times I had ruined an entire sheet of plywood by forgetting to take the depth of a joint (dado or rabbet, for you pros) into account or in some other fashion miscalculating, only to cut the piece too short. When I did get it right, I had recalculated the size of the piece so many times that everything was going too slowly.

The type of cabinets we are discussing are not limited to the kitchen. They can be in the study, in the laundry room, wall units in the kids' bedrooms, storage in the garage (can anyone be *that* neat?), bookcases (they're just cabinets without doors), linen storage, or any other use for a new cabinet in your home. The only difference between different cabinets is fanciness. Quality wood goes in nicer rooms. Inexpensive wood gets painted and goes in laundry rooms, garages, etc. A handy thing about cabinet making is that the rules have been very solidly established over the last 200 – 300 years. These rules are very specific:

- A frame door shouldn't be wider than 20″ or it will sag.
- Partitions shouldn't be farther apart than 32″ or the shelves between them may sag under the weight of their contents.
- A floor cabinet has a "toe kick" on each approachable (exposed) side so when people stand in front of it, there is a place for their toes to go (it's true, look in your kitchen).
- If the hinged side of a door is longer than 24″, then it should use three hinges instead of just two.
- The top of a counter should overhang 1″ on all approachable (exposed) sides.
- The kinds of joints used are the "dado" (slot) and the "rabbet" (notch) for the box and the "dowel" for the frame and door.
- The box is made of 3/4″ plywood, and it is faced with a 1″ x 2″ frame.
- There are many other rules as well.

THE Spreadsheet To The Rescue

Enter "THE Spreadsheet." If there's one thing "THE Spreadsheet" likes, its rules. I wondered if I could design a spreadsheet using the Apple which would accept a few basic measurements and options and then would print out a materials list. It was worth a try. It would certainly save me time. It just might be a boon to every homeowner who ever picked up a saw.

My starting place was a volume in the very popular *TIME/LIFE Home Repair and Improvement Series: "built–ins."* For those of you who own this gem, the section entitled "The Professional Way to Build a Cabinet" describes the cabinet's basic structure. For those of you who don't, check Figure #1.It's a drawing I made of the two basic cabinets: a wall hanging cabinet; and a floor standing one.

Real cabinets are designed in sections, made elsewhere, brought to the site, and secured in place. The Cabinetmaker is no exception. It designs sections which have basic overall dimensions. It will not accommodate a single cabinet structure that jogs, or goes up and over a window. It will solve that problem the way a professional cabinetmaker does. The cabinets are designed in sections that are joined together at the job site. First design the longer one that fits on the wall next to the window. Then design one to fit the space over the window. Finally, once the two are built, install them at the site right next to each other.

Pay particular attention to the joints. The "Cabinetmaker" assumes the basic construction will be identical. Note that the

Beagle Bros Apple® Software Report

"All the News That Fits"

Call 619-296-6400 or write for free Catalog

Summer 1985

NEW! *ProDOS Disk with Tip Book!*

PRO-BYTER™

$34.95 (Compatible with any Apple IIe, IIc or 64K II+/ProDOS™)

ALL-NEW— BYTEZAP PRO

Inspect ProDOS™ and DOS 3.3 disks at the byte level. Make changes, improvements and disk or program repairs that are normally impossible. An *all-new program* with instantaneous block-to-block (or sector-to-sector) viewing.

DISK SEARCH: Find any word or phrase on a disk. Automatically trace or search any file. Repair "zapped" disk bytes that might cause malfunction. Instant disk maps show which sectors or blocks any file occupies.

CUSTOMIZE DISKS: Easy instructions show how to make changes to disks, other programmers' programs, and DOS itself—a changed byte here and there can produce amazing results. Hey, this stuff is *FUN!*

NEW ProDOS UTILITIES

MACHINE LANGUAGE SORT: One CALL in your Applesoft program will alphabetize a list of words or numbers—*super-fast!* Works with normal string-arrays (*A$(1), A$(2),* etc.).

CONVERTER: Convert any Applesoft program line into machine code that can be CALLed by any Basic program.

TEXT TYPER: Read and print ProDOS text files (on your screen or printer) without having to boot another disk.

MORE: Put time and date of save in your disk catalogs. Print alphabetized lists of your ProDOS catalogs (including *all* hidden subdirectories). Make any Applesoft command work like any other. Scramble Basic so only you can read it...

MACHINE LANGUAGE EDITOR

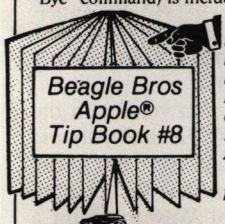
If you type in machine language programs from magazines, you'll *love* being able to make corrections by inserting and deleting code (no machine language knowledge required).

This easy-to-use editor also serves as a neat two-way-scrolling memory scanner. (Find out what's *really* going on inside your Apple's head.) The Pro-Byter manual shows you where in memory to look to find some very interesting stuff.

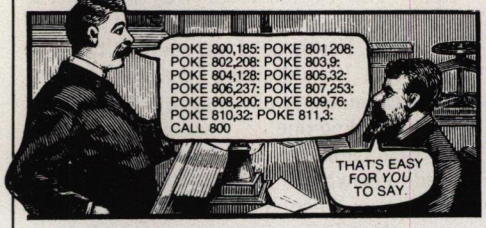
PLUS ALL-*NEW* APPLE TIPS

From the authors of DOS BOSS (Bert Kersey and Jack Cassidy)—page-after-page of juicy tips, experiments and inside info about your Apple. Learn secrets about Apple's new ProDOS operating system and Apple disk structure.

The latest official version of ProDOS (V1.1.1 with the new "Bye" command) is included on the Pro-Byter disk.



You get a GOLD MINE of tips, including: How to use memory like an extra disk drive (ProDOS lets you load & save files in RAM), How to disable the LIST command so it says "File Locked", How to disable or swap ANY command, How to change "Startup" to any name, How to personalize ProDOS catalogs...


POKE 800,185: POKE 801,208:
POKE 802,208: POKE 803,9:
POKE 804,128: POKE 805,32:
POKE 806,237: POKE 807,253:
POKE 808,200: POKE 809,76:
POKE 810,32: POKE 811,3:
CALL 800
THAT'S EASY FOR YOU TO SAY.

UTILITY CITY™

$29.50 (Compatible with any version of Apple II/DOS 3.3)

A-Plus Magazine Readers' Choice 1985 Product of The Year

21 USEFUL UTILITIES: ***List-formatter*** puts each statement on a new line with indented loops and printer page breaks. ***Multi-Cat*** lets you create multi-column catalog printouts. ***Filename Zap*** allows invisible and trick file names, etc. Utility City is for beginning as well as advanced Applesoft programmers—very educational.

NEW! *128K Extended Memory Utility!*

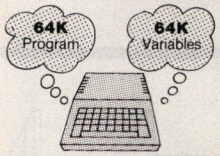
EXTRA K™

$39.95 (Compatible with any Apple IIc or 128K IIe/DOS 3.3 *and* ProDOS™)

PUT YOUR 128K TO WORK!

Even with 128K of memory, your Applesoft programs, pictures and variables only occupy and access the lower 48K. The EXTRA K disk contains several powerful programs that let you utilize *all* of that 128K capacity, speed and muscle.

EXTRA VARIABLES



Your Applesoft programs can now function undisturbed in main memory while all variables, strings and other data reside in your Apple's massive extra 64K. Everything functions normally—no special commands or procedures required.

EXTRA APPLE

EXTRA K lets you have two 64K Apples and programs in memory at once and switch between them at will. Plus, you can even have a ProDOS™ Apple and a DOS 3.3 Apple in memory simultaneously and swap files back and forth without subjecting yourself to Apple's *Convert* program.

EXTRA-FAST COPIES

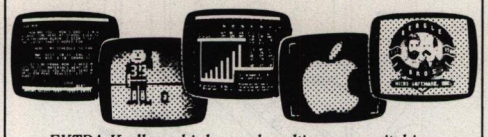
Make disk copies fast and "on-the-spot" without re-booting! EXTRA K's "nibble copier" duplicates *and verifies* unprotected disks in 35 SECONDS instead of 1½ minutes. Thanks to your Apple's 128K, only 3-4 passes per disk are necessary.

EXTRA FEATURES

Compare any two disks, byte-for-byte. Create "dual personality" ProDOS/3.3 disks. Peek and poke auxiliary memory. Keep a live "logbook" of everything that has appeared on your text screen and review it when you want...

EXTRA SCREENS

Store all kinds of images in memory and display any one (all or part) instantly. Up to 7 hi-res pictures or 62 text screens can be stored at once. Call several pictures to the screen per second, opening up new Apple animation possibilities.



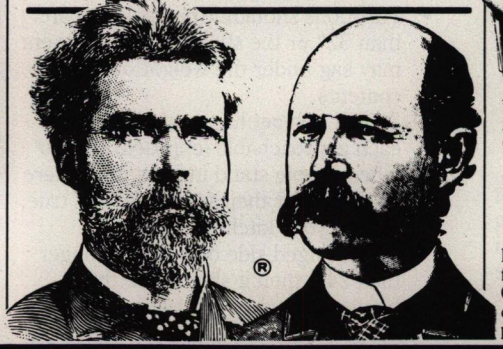
EXTRA K allows high-speed multi-screen switching.

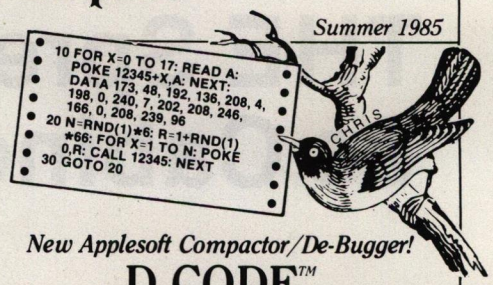
DOS BOSS™

$24.00 (Compatible with any version of Apple II/DOS 3.3)

CUSTOMIZE DOS 3.3

Change *Catalog* command to *Cat,* or *"Syntax Error"* to *"Oops!",* or anything you want. ***Protect your programs:*** An unauthorized Save-attempt can print "Not Copyable". List Prevention, other useful tips and fascinating experiments. DOS Boss will teach you a ton about Apple programming!





New Applesoft Compactor/De-Bugger!

D CODE™

$39.95 (Compatible with any version of Apple II/DOS 3.3 *and* ProDOS™)

PROGRAM PACKER

D CODE squeezes all of the wasted and unused bytes out of your Applesoft programs, saving valuable memory space and increasing your programs' speed and efficiency.

Automatically combine program lines, shorten variable names and/or remove REMarks. D CODE also uncovers wasted program lines that can't possibly be executed.

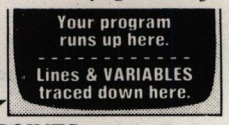
AUTO-PROOFREADER

Keyboard errors are caught as you type. If you enter an illegal program line, you are told immediately—*before* you (or worse—someone else) runs your program. Or you may simply type "CHECK" to scan an *entire program* in a couple of seconds and uncover potential crashes. If no mistakes are found, you get an immediate "NO ERRORS" message.

SUPER-TRACE

When a program stops or crashes, type "DUMP" to see the last 10-10,000 statements and line numbers that were executed, in the order executed—an instant program *history.*

D CODE features sophisticated "live" tracing too, with each executing statement, line number and selected variable values appearing in a window at the bottom of the screen.



BREAKPOINTS

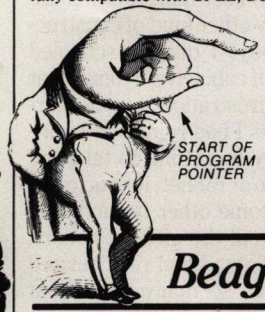
D CODE lets you set up de-bugging "breakpoints" so your program stops when you want. For example, you can ask that your program be stopped the moment X gets set to 99, or the 3rd time a particular program statement is encountered.

LIGHTNING-FAST FIND!

D CODE lets you find strings and variables *fast*—even large programs can be searched in about *2 seconds!* All lines with a specified word are automatically listed with the word highlighted. This feature alone is worth the price of D CODE.

GPLE COMPATIBLE

D CODE remains "transparent" to your programs and is fully-compatible with GPLE, Double-Take, ProntoDOS, etc.




```
 1 HOME: HTAB 5: POKE
   33,28: FOR C=1 TO 92:
   POKE 50,255-192*
   (C=4 OR C=64)
 9 J=J+1-31*(J=31):
   PRINT CHR$(9+(J=1));
   SPC(2+(J<10))J;:
   NEXT: PRINT
85 POKE 33,1: PRINT
   "JULY..AUG..SEPT...."
```

Beagle GAMES

I. O. SILVER™

$29.95 (Compatible with any version of Apple II)

HI-RES STRATEGY!

I. O. SILVER is *both* a thinking person's strategy game and a fast-action arcade game. Your job is to create a hi-res "Super Computer" on the screen while avoiding a pesty gang of computer bugs. I. O. Silver's Strategy Workshop lets you plan your moves before each level. Excellent high-speed animation and hi-res action. Great for ages 12 & up.

SOURCE CODE: Programmers can get fully commented *I. O. Silver* Source Code on three 2-sided disks for $30. Ordering info comes with the game.

SILICON SALAD™

$24.95 (Compatible with any version of Apple II/DOS 3.3)

OVER 100 PROGRAMS!

Program Splitter makes room for hi-res graphics in big programs, ***Disk Scanner*** finds bad sectors, ***DOS-Killer*** adds 2 disk tracks of disk space, ***2-Track Cat*** doubles the number of files, ***Text Imprinter*** converts text screen text to hi-res...

BEAGLE BAG™

$29.50 (Compatible with any version of Apple II)

12 GREAT BASIC GAMES

Voted by Apple software buyers to *Softalk's* "Top-30 Most Popular" list, Beagle Bag is one of the best Apple game bargains on the market today. All games are LIST-able, so you can see what makes them work, or make changes.

Beagle Bros MICRO SOFTWARE

The Apple Programmer's Best Friend

BEAGLE BROS, INC.
3990 OLD TOWN AVENUE, SUITE 102C
SAN DIEGO, CA 92110 PHONE 619-296-6400

Print Pictures on Your Printer!

TRIPLE-DUMP™

$39.95 (Compatible with any version of Apple II/DOS 3.3 *and* ProDOS™)

PRINT ANY APPLE IMAGE

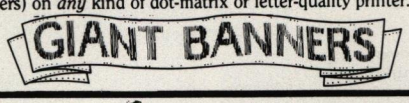
TRIPLE-DUMP lets your dot matrix graphics-capable printer print *(1)* Hi-Res and Double Hi-Res graphics. *(2)* Lo-Res and Double Lo-Res graphics. *(3)* Forty and 80-Column text screen text.

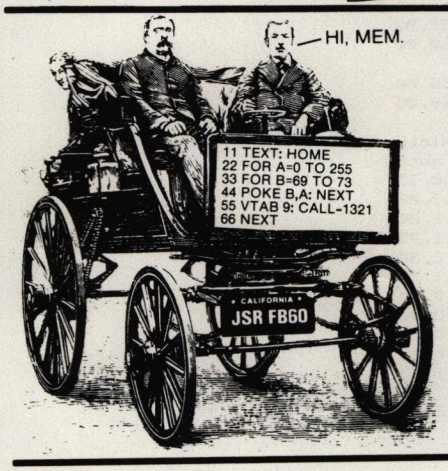
All kinds of images can be transfered to your printer with absolutely no programming knowledge. *Or* you can call Triple-Dump's routines from your own Applesoft Basic programs.

TRIPLE-DUMP gives you a full range of special effects—crop, rotate, magnify, compress, adjust density, etc.

GIANT BANNERS TOO

Print big signs and messages of all kinds (with 8½" high letters) on *any* kind of dot-matrix or letter-quality printer.





FATCAT™

$34.95 (Compatible with any version of Apple II/DOS 3.3 *and* ProDOS™)

APPLE-DISK LIBRARIAN

Organize your disk library! FATCAT enters all of your ProDOS and 3.3 disk catalogs into one or more "Master Catalog" for fast searching, sorting and printing. Find the files you're looking for and eliminate space-wasting duplicates.

You can update your Master Catalog at any time by simply letting FATCAT read in your new or altered disks.

ALPHABETIZE FILE NAMES

FATCAT will sort your ProDOS and 3.3 disks so they catalog in alphabetical order. Or you can re-arrange file names in any order. *Compare* any two files too, and find the differences.

DISKQUIK™

$29.50 (Compatible with Apple IIc or 128K IIe/DOS 3.3)

DOS 3.3 IN-MEMORY DISK DRIVE!

DISKQUIK makes your Apple IIc or 128K IIe think it has an extra drive connected to Slot 3. It's just like using a super-fast (hard-disk speed), silent drive. Catalog with a "CATALOG,S3" command. Save and load all kinds of files to and from RAM with normal commands (holds about *half* the data of a floppy).

MANY USES: For example, load often-used programs into memory when you boot, so they are ready to use.

PRONTO-DOS™

$29.50 (Compatible with any version of Apple II/DOS 3.3)

TRIPLE-SPEED DOS 3.3!

ProntoDOS lets you load & save files at triple speed. Hi-res pix, for example, load in under 3 seconds.

MORE RAM & DISK SPACE

Create high-speed bootable disks with 15 extra sectors of space. Move DOS 3.3 to your Language Card (64K reqd.) for an *extra 10K* of usable memory. Also: Pronto's new *TYPE* command instantly displays DOS 3.3 text file contents.

Hi-Res Shapes and Fancy Type!

APPLE MECHANIC™

$29.50 (Compatible with any version of Apple II/DOS 3.3)

HI-RES SHAPE ANIMATION

Your drawings are converted into hi-res "shape tables" so your programs can perform animation with Apple's built-in DRAW & XDRAW commands. *List and Learn* disk demos teach you how to create your own animated hi-res programs.

FANCY DISPLAY TYPE

Six proportionally-spaced hi-res screen-display fonts (both large and small) are included on the Apple Mechanic disk—

WESTERN: KLMN
apple: ABCDEFG
STENCIL: ABCDE

26 more typefaces are available on our *Apple Mechanic Typefaces*™ disk (sold separately: $20.00).

16-COLOR DOUBLE HI-RES GRAPHICS!

BEAGLE GRAPHICS

$59.95 (Compatible with Apple IIc or 128K IIe/DOS 3.3 *and* ProDOS™)

DOUBLE HI-RES

Access 16 hi-res colors and 560 (horiz.) x 192 (vert.) pixels (*twice* normal resolution) on your Apple IIc or 128K IIe.

AS AN ARTIST, you can draw, fill and label double hi-res pictures using just the keyboard, *or* your AppleMouse™, joystick, Koala Pad™ or Graphics Tablet. Easy-to-use icon-assisted *Cut & Paste* features make graphic manipulations easy. Any image section may be altered or re-located.

OR, AS A PROGRAMMER, you get 33 new commands for drawing, filling and manipulating double-res images. You can convert normal programs and pictures to double-res, save and load any image section, compress picture data to 1/3 disk space, produce double-res "slide shows" and more.

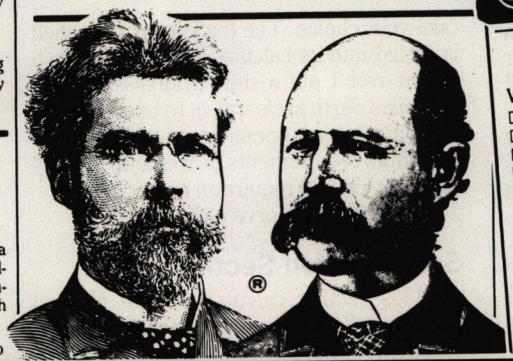
EXCELLENT REVIEWS—see Jan-85 *A-Plus* Magazine.

BEAGLE BASIC™

$34.95 (Compatible with unenhanced Apple IIe or 64K II+/DOS 3.3)

BETTER APPLE BASIC

Put Applesoft in RAM so you can change and improve it. Add new commands to Basic, like *ELSE, SWAP, TONE...*



Public Notice

Beagle Bros products are available at most Apple software stores. If your favorite dealer doesn't have a particular disk, get on his case. He can have it in his store for you in 2 or 3 days by phoning Beagle Bros or *any* U. S. Apple Software Distributor.

GPLE™

$49.95 (Compatible with any version of Apple II/DOS 3.3 *and* ProDOS™)

THE APPLE PROGRAM EDITOR

GPLE is Beagle Bros' "GLOBAL PROGRAM LINE EDITOR", the most popular, efficient way to edit Applesoft programs. GPLE works like a *word processor* for Basic program lines.

INSERT & DELETE

Now you can *quickly* make changes to your programs. No more awkward "escape-editing" to make changes. No more hassles with extra spaces in quote statements. No more slow "cursor-tracing" to the end of a line before pressing Return.

SEARCH & REPLACE

Find every occurrence of a string or variable in your programs. Or *replace* any word with any other. For example, change all X's to ABC's, or all "HORSE" strings to "COW".

FUNCTION KEYS

Define your own Apple "function keys". For example, ESC-1 can Catalog drive 1, ESC-N can clear the screen and type your name and address, etc. Customize your Apple with a set of ESC functions that perform any set of tasks that you want.

DOUBLE-TAKE™

$34.95 (Compatible with any version of Apple II/DOS 3.3 *and* ProDOS™)

2-WAY SCROLLING

Listings and disk Catalogs scroll both up *and* down, making file names and program lines easier and faster to find. You change scroll-direction with the Arrow keys. Machine language listings and Hex-Ascii dumps scroll two-ways too.

BETTER LIST FORMAT

Double-Take's easy-to-read listings have each Applesoft program statement on a new line for *fast* program reading.

BONUS FEATURES

A$="ABC"
X=3.14159
Y=255
← VARIABLE-DISPLAY: Instantly prints all of your program's variables in the order used, with their current values.

A$: 5 10 150
X: 10 20 3000
Y: 5 40 55 60
← CROSS-REFERENCE: Alphabetizes every variable your program uses, and displays them with their line numbers.

Plus AUTO-LINE-NUMBER, improved Re-Number, Hex-Dec Convert, Program Stats, eliminate/re-define the cursor...

Visa/MasterCard or COD, order Toll Free
ALL 50 STATES/24 HOURS (orders only)
1-800-227-3800 ext.1607

Beagle Bros products are on the shelves at your local Apple Software Store.

We also ship *FAST* via First Class Mail:

☐ Alpha Plot	$39.50	☐ Fatcat	$34.95
☐ Apple Mechanic	29.50	☐ Flex Type	29.50
☐ A.Mech.Typefaces	20.00	☐ Frame-Up	29.50
☐ Beagle Bag	29.50	☐ GPLE	49.95
☐ Beagle Basic	34.95	☐ I. O. Silver	29.95
☐ Beagle Graphics	59.95	☐ Pro-Byter	34.95
☐ D Code	39.95	☐ ProntoDOS	29.50
☐ DiskQuik	29.50	☐ Silicon Salad	24.95
☐ DOS Boss	24.00	☐ Tip Disk#1	20.00
☐ Double-Take	34.95	☐ Triple-Dump	39.95
☐ Extra K	39.95	☐ Utility City	29.50

ADD $1.50 FIRST CLASS SHIPPING (ANY SIZE ORDER).
COD add $3.00/California add 6%/Overseas add $4.00

NAME _____

ADDRESS _____

_____ ZIP _____

VISA/MCARD# _____

EXPIRATION DATE _____ VISA MasterCard

MAIL DIRECTLY TO BEAGLE BROS.
WE PROCESS ALL ORDERS IMMEDIATELY.

Beagle Bros MICRO SOFTWARE

The Apple Programmer's Best Friend

BEAGLE BROS, INC.
3990 OLD TOWN AVENUE, SUITE 102C
SAN DIEGO, CA 92110 PHONE 619-296-6400

© 1985, Beagle Bros, Inc.

top strip sets in a 3/8″ notch (called a rabbet joint) when it meets the side piece. Also note that the partition is set in a 3/8″ deep slot (called a dado joint) when it meets the bottom piece. There are other rabbets and dados. The final joints to note, however, are the frame and door frame joints which carry two dowels between them at each place where two pieces of wood join.

Operation

Let's look more closely at the Cabinetmaker and see how it functions. If you look at Listing #1, you'll notice that there are three sections: Input, Specifications, and Material. I've protected all the cells on the spreadsheet except 12 in the Input section to ease data entry. Tab or Open–Apple–Tab (on the *II*e, *II*c) and Control–I or Control–Y (on the II, II+ series) allow input to those items only without having to use arrows to glide over non–useful cells.

Input Section

In the Input section, the user is faced with two choices. The first choice, do I want this cabinet to hang on the wall or stand on the floor? Figure #1, again, shows the difference. The next choice: Door Type, is a little more obscure. A "double" uses two doors which close to cover up one opening. A "single" uses one door for every cabinet opening. There are pros and cons for each. I prefer the "single" myself.

Partitions, the next entry, are again illustrated in Figure #1. They divide up the space (but they do not include the side pieces) and they give the shelves a resting place. Notice, to the right, there is a warning. The square in front of this comment checks to be sure that a normal number of partitions exist for the number of doors chosen. For normal entries, it will print a "0." For unusual or wrong entries, it will call the user's attention to the note with a "111."

"Exposed ends" means just that. The front of a cabinet is always exposed. One or both ends may not be. They may end at a wall or another cabinet. Exposed floor cabinets get 1″ top overhang and a 3″ toekick for each exposed end. All non–exposed ends have all parts completely flush. In addition, a non–exposed end has its side shortened so that it will sit on a flush base instead of hanging over as it does when there is a toekick.

When entering the overall size (next), inches are used. The width is the total distance horizontally along the wall. The height is the total vertical distance. Finally, the depth is the total distance out from the wall that the cabinet should extend.

The lumber used for the facing frame and door frames can vary quite a bit. It is usually around 2″ x 1″. Enter the exact amounts in these cells.

Shelf clearance is the minimum vertical clearance you expect between each of your shelves. A normal entry is 12 inches, but

```
THE CABINETMAKER                                    marker movement
John W. Geddis, III                              IIe:( use TAB or OPEN APPLE-TAB )
San Gabriel, Calif.                              II+:( use CTRL-I or CTRL-Y )
                                            location:BOB'S TRAIN CABINET
INPUT SECTION==============================COMMENTS-----------------------------
CABINET TYPE                                        ------------------------------
     floor=0 wall=1:        1                       | 111 = note adjoining comment |
DOOR TYPE                                           |   0 = disregard comment      |
  double=0 single=1:        1                       ------------------------------
STRUCTURE
          # of doors:       2
    # of partitions:        1                       0 odd mix of doors & partitions
  # of exposed ends:        2                       0 no more than 2 ends
SIZES (inches)          width height  depth
       overall size:    36.00  42.00  12.75
  frame lumber size:     2.00    .75
    shelf clearance:           12.00
SPECIFICATIONS==========================
                        width height  depth
            box size:   36.00  42.00  12.75
           base size:    0.00   0.00   0.00
 between partitions:    16.88                       0 below 32" prevents shelf sag
       opening size:    15.00  38.00  11.75
          door size:    16.00  39.00                0 below 20" wide prevents door
                                                      sag
        # of shelves
     (incl. bottom):          3
    vert shelf space
    (evenly spaced):           12.17
MATERIAL================================
                        # of length length
FACING FRAMES          pieces   each  total
              stiles:       3  42.00 126.00
               rails:       4  15.00  60.00
DOOR FRAMES
              stiles:       4  39.00 156.00
               rails:       4  12.00  48.00

                        # of length  width
PLYWOOD                pieces   each   each
           1/4"back:       1  35.25  40.75
          3/4" side:       1  42.00  12.00
          3/4" side:       1  42.00  12.00
        3/4" bottom:       1  35.25  11.75
           3/4" top:       1  35.25  12.50
         partitions:       1  41.25  11.75
         top strips:       0   0.00   0.00
        hanger bars:       1  34.50   3.00
       base frnt/bk:       0   0.00   0.00
      base spreader:       0   0.00   0.00
             shelves:      4  16.88  11.75 111 allow clearance for shelf
HARDWARE                                          hangers
       door inserts:       2  35.75  12.75
     veneer (shelf):          67.50
       veneer (top):           0.00
        glue dowels:      32
        clip strips:       4
        shelf clips:      16
            latches:       2
              knobs:       2
             hinges:       6            use   3 hinges on each door.
```

take your choice. The thickness of the shelf is added into its calculations. The Cabinetmaker won't put a shelf in unless there is sufficient vertical clearance to be divided by a shelf into two openings which meet the minimum requirements. For example, a 12″ minimum would require an opening to be 24 ¾″ high to deserve a shelf.

Specification Section

This section calculates some general data based on your input in the previous section.

- The box size is the constructed size of the main plywood structure. The top's overhang (if any) and the base (again, if any) are eliminated in this specification. The base size (if you chose a floor type cabinet in the previous section) is the size of the base after it's constructed.
- The remaining specifications determine how functional the resulting cabinet will be for your purposes. Opening size tells how big the unobstructed opening behind each door (or double door) is.
- The overall door size allows each door to overlap the cabinet frame by 1/2″ on each edge. If the double door option has been chosen, the two just meet in the middle and don't overlap anything. The combination of the two doors overlaps the opening by 1/2″ all the way around.
- The bottom of the cabinet is a shelf that you'll put things on, but not a removable shelf that must be made. It's counted with all the shelves here because it's used that way in real life.
- Finally, the Cabinetmaker subtracts the thicknesses of the top, base, bottom, shelves, and frame widths; takes

into account joint depths and the minimum shelf clearance you entered earlier; and delivers the actual vertical space between shelves. If it's too big, you can adjust the shelf clearance in the input section and see at what clearance an additional shelf is possible.

- The caution messages on the right are just that: cautions. They "turn on" when the recommended sizes are exceeded. Tradition dictates those specifications but they are rules of thumb. If the shelves are only lightly loaded you may be able to exceed 32".

Material Section

This section gives all the piece parts necessary to make the finished cabinet (except glue and any nails). However, a strong word of caution. If a computer were making the cabinet, the dimensions in this section could be used without hesitation. But humans do woodworking. Humans can make very slight errors when they measure and cut things. It doesn't hurt to check critical components against the partially finished cabinet before cutting. As your skills and consistency improve, you can use the Cabinetmaker to precut all parts. Check figure #1 to verify part placement.

- The Facing Frames cover all the raw front edges of the sides, partitions, bottom, and top (on the wall version).
- All the Plywood parts are 3/4" thick except the back which is only 1/4" thick.
- The 1/4" back fits into rabbets in the sides and covers the bottom edge. It covers the top edge on the wall cabinet and does not on the floor model.
- The sides can be different sizes, which is why they're listed separately. If the side is exposed, it's longer because it hangs down over the base into the toekick space. If it is concealed, it's shorter because it stops at the top of the base.
- The bottom is the same for both the wall and the floor unit. It fits into a dado (slot) in either side and is covered by the back and the front frame. By the way, the top of the rail of the front frame is flush with the top surface of the bottom piece.
- Mounting screws are driven through the hanger bar into the wall studs in your house to hang the cabinet.
- The base spreaders fit between the base's front and back. They fit under the sides and partitions and between for additional support.
- The shelves need to be cut shorter than listed to allow for whatever support system is used. As there are so many different types, simply subtract the clearance necessary for the one you choose from the total shelf length.
- The Hardware consists of the miscellaneous items you'll need to complete the task. The door inserts can be glass, 1/4" decorative plywood, chair caning, carved wood panels (beyond my skills), cloth, or whatever. The door frame is notched 3/8" from the back to provide a secure place for the panel. Thus the panel is 3/4" larger all around than the inside measurement of the door frames.
- The veneer is 3/4" wide and covers the front edges of the movable shelves and the top of the floor unit. There are two glue dowels used at every joint in the frame.

Filling Up THE Spreadsheet

It's quite easy to enter the formulae and data which turn THE Spreadsheet into the Cabinetmaker. Listing #2 makes it very easy. Follow the directions at the beginning to construct the general form of your worksheet.

Then, just place your cursor on the cell address and type in the information which follows the ':'. It doesn't take too long to figure out there are a lot of '/F$' and '/FR' entries. Rather than type each '/F$' and '/FR', simply wait until the entire worksheet is entered and then use the "replicate attributes" '/R(A)' to copy the '/F$' or '/FR' to the entire worksheet.

Finally, (following the directions in listing #2 again) protect the entire worksheet and unprotect the 12 changeable cells in the input section. The TAB key and/or the ctrl-I / ctrl-y can then guide the marker to the unprotected cells of the input section. You're then off to some classic cabinetwork and always-needed extra storage space.

```
THE CABINETMAKER
listing using
THE Spreadsheet 2.0

1) set calculation order for row
   calculation.   /GOR
2) set column A at width 20.   /GCC20
3) set column E at width 4.   /GCC4
4) set column F at width 31.   /GCC31
5) enter all cell contents at addresses
   listed below.
6) protect the entire worksheet.   /GAP
7) save it

CELL      CELL
ADDRESS   CONTENTS

F61:      " hinges on each door.
E61:      @IF(C24)24,3,2)
D61:      /FR"use
B61:      @IF(C24)24,B53*3,B53*2)
A61:      /FR"hinges:
B60:      +B53
A60:      /FR"knobs:
B59:      +B53
A59:      /FR"latches:
B58:      +B51*4
A58:      /FR"shelf clips:
B57:      +B12*4*@IF(B51)0,1,0)
A57:      /FR"clip strips:
B56:      ((B33-2)*8)+(2*4)+(B36*4)
```


P-tral®:
BASIC to Pascal
Translation Software

P-tral is the user-friendly translation software that converts Applesoft BASIC programs to Apple Pascal.

- Translates any business, scientific, graphics and game software from source.
- Translation results approach 100%!
- Translates any sized program — large or small.
- Essential compile directives generated.

P-tral's innovative features include:

- Simulation of BASIC's sub-routine stack to handle undisciplined GOSUBS.
- Interactive resolution of variable name differences to overcome problems with different syntax rules and different reserved word lists.

PIONEER VERSION
ONLY $125.00

Requirements: **64K RAM, DOS 3.3**
80-column card
Apple II, II+, IIe, IIc
Apple Pascal 1.1
or 1.2

For ordering information and brochure, call or write:

Woodchuck Industries®
340 West 17th Street,
Suite 2B
New York, NY 10011
(212) 924-0576
Attn: J.K. Dyson

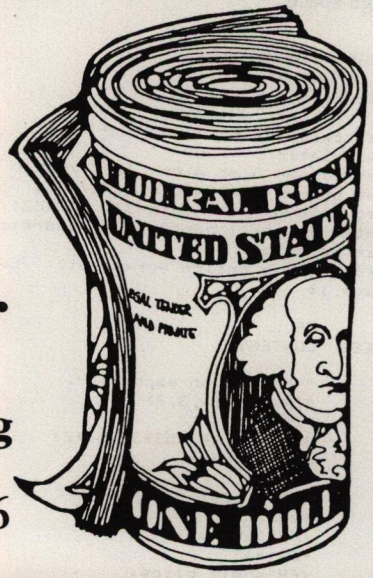
Circle 80 on Reader Service Card

```
A56:    /FR"glue dowels:
C55:    /F$@IF(B7)0,0,(B15)+
          (B13*D13))
A55:    /FR"veneer (top):
C54:    /F$+B51*C51
A54:    /FR"veneer (shelf):
D53:    /F$+B24-(2*B16)+.75
C53:    /F$+C24-(2*B16)+.75
B53:    +B11
A53:    /FR"door inserts:
F52:    " hangers
A52:    "HARDWARE
F51:    " allow clearance for shelf
E51:    @IF(B51=0,0,111)
D51:    /F$@IF(B51=0,0,D20-.25-C16)
C51:    /F$@IF(B51=0,0,B22)
B51:    (B12+1)*(C27-1)
A51:    /FR"shelves:
D50:    /F$@IF(B50=0,0,C21)
C50:    /F$@IF(B50=0,0,D21-1.5)
B50:    @IF(B7)0,0,2*B12+3)
A50:    /FR"base spreader:
D49:    /F$@IF(B7)0,0,5.25)
C49:    /F$@IF(B7)0,0,B21)
B49:    @IF(B7)0,0,2)
A49:    /FR"base frnt/bk:
D48:    /F$@IF(B7)0,3,0)
C48:    /F$@IF(B48=0,0,B20-1.5)
B48:    @IF(B7)0,1,0)
A48:    /FR"hanger bars:
D47:    /F$@IF(B7)0,0,3)
C47:    /F$@IF(B47=0,0,C44)
B47:    @IF(B7)0,0,2)
A47:    /FR"top strips:
D46:    /F$@IF(B46=0,0,D20-.25-C16)
C46:    /F$@IF(B46=0,0,@IF(B7)0,
          C20-.75,C20-B16-.75+.375))
B46:    +B12
A46:    /FR"partitions:
D45:    /F$@IF(B7)0,D20-D16-.25,D15)
C45:    /F$@IF(B7)0,B20-.75,B15)
B45:    1
A45:    /FR"3/4" top:
D44:    /F$+D20-.25-C16
C44:    /F$+B15-.75
B44:    1
A44:    /FR"3/4" bottom:
D43:    /F$+D20-C16
C43:    /F$@IF(B7)0,C20,@IF(B13)1,
          C20-.75,C20-B16))
B43:    1
A43:    /FR"3/4" side:
D42:    /F$+D20-C16
C42:    /F$@IF(B7)0,C20,@IF(B13)0,
          C20-.75,C20-B16))
B42:    1
A42:    /FR"3/4" side:
D41:    /F$@IF(B7)0,C20-B16+.75,
          C20-B16)
C41:    /F$+B20-.75
B41:    1
A41:    /FR"1/4"back:
D40:    /FR"each
C40:    /FR"each
B40:    /FR"pieces
A40:    "PLYWOOD
D39:    /FR"width
C39:    /FR"length
B39:    /FR"# of
D37:    /F$+B37*C37
C37:    /F$+B24-(2*B16)
B37:    +B11*2
A37:    /FR"rails:
D36:    /F$+B36*C36
C36:    /F$+C24
B36:    +B11*2
A36:    /FR"stiles:
D35:    /F$"
A35:    "DOOR FRAMES
D34:    /F$+B34*C34
C34:    /F$+B23
B34:    @IF(B9)0,B11*2,B11)
A34:    /FR"rails:
D33:    /F$+B33*C33
C33:    /F$+C20
B33:    @IF(B9)0,B11+1,(B11/2)+1)
A33:    /FR"stiles:
D32:    /FR"total
C32:    /FR"each
B32:    /FR"pieces
A32:    "FACING FRAMES
D31:    /FR"length
C31:    /FR"length
B31:    /FR"# of
D30:    /FR/-=
C30:    /-=
B30:    /-=
A30:    "MATERIAL==========
C29:    /F$((C23+.75)-(C27*.75))/C27
A29:    /FR"(evenly spaced):
A28:    /FR"vert shelf space
C27:    @IF(@INT((C23+.75)/(C17+.75)
          )(1,1,@INT((C23+.75)/(C17+.75)))
A27:    /FR"(incl. bottom):
A26:    /FR"# of shelves
F25:    " sag
F24:    " below 20" wide prevents door
E24:    @IF(B24)20,111,0)
C24:    /F$+C23+1
B24:    /F$@IF(B9)0,B23+1,B23+.5)
A24:    /FR"door size:
D23:    /F$+D20-1
C23:    /F$+C20-(B16*2)
B23:    /F$@IF(B9)0.(B20-(B16*(B11+1)))/B11,
          (B20-(B16*((B11/2)+1)))/(B11/2))
A23:    /FR"opening size:
F22:    /F$" below 32" prevents shelf sag
E22:    @IF(B22)32,111,0)
B22:    /F$(B20-(((B12+1)+1)*.75))/(B12+1)
A22:    /FR"between partitions:
D21:    /F$@IF(B7)0,0,D20-3)
C21:    /F$@IF(B7)0,0,B16-.75+4)
B21:    /F$@IF(B7)0,0,B20-(B13*3))
A21:    /FR"base size:
D20:    /F$@IF(B7)0,D15,D15-1)
C20:    /F$@IF(B7)0,C15,C15-4)
B20:    /F$@IF(B7)0,B15,B15-B13)
A20:    /FR"box size:
D19:    /FR"depth
C19:    /FR"height
B19:    /FR"width
D18:    /-=
C18:    /-=
B18:    /-=
A18:    "SPECIFICATIONS======
C17:    /F$/AV12
A17:    /FR"shelf clearance:
C16:    /F$/AV.75
B16:    /F$/AV2
A16:    /FR"frame lumber size:
D15:    /F$/AV18
C15:    /F$/AV29.5
B15:    /F$/AV23.5
A15:    /FR"overall size:
D14:    /FR"depth
C14:    /FR"height
B14:    /FR"width
A14:    "SIZES (inches)
F13:    " no more than 2 ends
E13:    @IF(B13)2,111,0)
B13:    /AV0
A13:    /FR"# of exposed ends:
F12:    " odd mix of doors & partitions
E12:    @IF(B12+1=B11,0,@IF(B12=0,0,111))
B12:    /AV1
A12:    /FR"# of partitions:
B11:    /AV2
A11:    /FR"# of doors:
A10:    "STRUCTURE
F9:     /--
B9:     /AV1
A9:     /FR"double=0 single=1:
F8:     "|   0 = disregard comment      |
A8:     "DOOR TYPE
F7:     "| 111 = note adjoining comment|
B7:     /AV0
A7:     /FR"floor=0 wall=1:
F6:     /-_
A6:     "CABINET TYPE
F5:     "ENTS--------------------------
E5:     "C0MM
D5:     /-=
C5:     /-=
B5:     /-=
A5:     "INPUT SECTION=======
F4:     /AL
E4:     "ion:
D4:     /FR"locat
F3:     "( use CTRL-I or CTRL-Y )
E3:     "II+:
A3:     "San Gabriel, Calif.
F2:     "( use TAB or OPEN APPLE-TAB )
E2:     "IIe:
A2:     "John W. Geddis, III
F1:     "marker movement
A1:     "THE CABINETMAKER
```


IF YOU HAVE A HARDWARE DESIGN FOR THE APPLE, APPLIED ENGINEERING PAYS TOP DOLLAR FOR GOOD HARDWARE DESIGNS.

Please call or write

Applied Engineering
P.O. Box 798
Carrollton, TX 75006
(214) 241-6060



Circle 52 on Reader Service Card

Adjustable Planning Calendar

Harold Shuckhart

As a teacher, I have used many different methods of planning. I found a blank calendar with only the school days on it to be the most useful. At first I drew out a grid on paper which was photocopied and I then added the numbers from the normal calendar.

When I acquired a computer and printer, I began used them for grading, test writing, etc.

The program listed with this article allows various blank calendars to be printed, with months and dates. See the figures accompanying this article for examples.

The program asks for the following input:

- current year correct?
- current month (1–12)?
- date of Monday to start at?
- number of planning days (5–7)?
- number of weeks to print?
- number of weeks in a block?
- size of a square?
- if January or February, is this a leap year?

I chose to start the week with Monday as most workweeks of five or six days start with Monday. The program adjusts the width of each day, about 15 spaces for a five day week, 11 spaces for a seven day week.

The program allows for any number of weeks to printed. If the time interval passes the end of the month, the new month name is printed. If the year is a leap year and calendars from January or February are requested, February is counted as 29 days. If the time interval passes the end of a year, the year number is updated and printed between weeks following the beginning of the month.

The names of the days of the week are printed across the top of the calendar blank and may also be printed at regular intervals by changing the number of weeks in a block. With a calendar eight weeks long, and a block of two weeks, the days of the week will be printed every other week. If the block length is more than the number of weeks to be printed, the days of the weeks will appear only once.

The size of a square actually controls the height of a blank space on the calendar, since the width is controlled by the number of days in the planning week. Assuming six lines per inch, the following would yield square boxes on the calendar:

- 5 day workweek – square size of 7
- 6 day workweek – square size of 6
- 7 day workweek – square size of 5

Programming notes

All of the subroutines and data were placed at the beginning of the program to speed execution.

The programming was done "top down." With the exception of the error interceptions, all GOTOs are forward jumps.

All INPUTs accept strings and then convert to numbers if necessary. This prevents the REENTER error message. Error checking is done and if an error is detected the INPUT is requested again.

Wherever possible, I used ON... GOTO rather than IF...THEN. This would allow for the use of a cruncher to compress the program more, as nothing following an IF...THEN will be executed if the condition is false.

In lines 350, 630, and 980, CHR$(8) is a backspace which leaves the last character in the printed string flashing as a default value. The user may type any letter or just a return to accept the default.

In lines 150 and 270, variable spacing is achieved by the use of a formula inside the SPC( ) command. The formulas were derived by plotting the given values for the weeklength (WL) and desired values for the spacing. When this yielded a straight line, it was simple to write the equation of the line and use it as a formula.

Data:	weeklength	spacing
	5	14
	6	12
	7	10

Plotting this data with spacing as the dependent variable yields a straight line with an slope of –2 and an intercept of 24. The equation is:

```
Spacing = -2 * weeklength + 24
```

This is used as shown:

```
150 PRINT ":"; SPC( 24 - 2 * WL);
```

In lines 1140 and 1150, slightly differnt formulas are used. In line 1150 the SPC() command is:

```
SPC(22 - 2 * WL + (MS + I < 10))
```

The first part (22 – 2 * WL) was developed as in line 150. But this line adds one more space only if MS + I is less than 10. When Applesoft encounters the inside set of parentheses it evaluates as 1 if the statement inside is true and 0 if it is false. Thus, when MS + I is less than 10, a space is added to keep the vertical lines aligned.

The program can be shortened by removing (or not typing) lines 350 – 500, the instructions. If you are not concerned with error checking, the following lines can be removed:

```
680, 720, 760, 780, 810, 830, 860, 900, 940.
```

Since we won't need to worry about a leap year until 1988, lines 970 – 1010 could be cut.

The paper position routine from 1020 – 1060 can be removed, also.

Possible Enhancements

- Substitute a routine to check for leap years in lines 970 – 1010.
  (Every fourth year is a leap year unless divisible by 100, except if divisible by 400. Thus 1900 was not a leap year, but 2000 will be.)
- Change the spacing functions to allow for elite (100 characters per 8.5 inches) or for 15 inch paper.
- Insert a routine to start a new month on a new line, but at the proper day of the week, as other calendars do.
- Add special printer routines to take advantage of special characters for the months, expanded days of the week etc.
- Add a personalization routine to print the name of the planner at the top of the sheet.
- Insert a routine to count lines and to jump over the perforation on pin feed paper.

CALENDAR Listing 1

```
100  HOME
110  VTAB 2
120  GOTO 350
130  FOR J = 1 TO NL
140  FOR I = 1 TO WL
150  PRINT ":"; SPC( 24 - 2 * WL);
160  NEXT
170  PRINT ":"
180  NEXT
190  FOR I = 1 TO  INT (79 / WL) * WL + 1
200  PRINT "-";
210  NEXT
220  PRINT
230  IF F2 THEN  PRINT  TAB( 38);YR:F2 = 0
240  RETURN
250  PRINT ":";
260  FOR I = 1 TO WL
270  PRINT  SPC( 18 - 2 * WL);D$(I);
280  NEXT
290  PRINT
300  GOSUB 190
310  RETURN
320  DATA "MON   :", "TUE   :", "WED   :", "THU   :",
     "FRI   :", "SAT   :","SUN   :"
330  DATA JAN,FEB,MAR,APR,MAY,JUN,JUL,AUG,SEP,OCT,
     NOV,DEC
340  DATA 31,28,31,30,31,30,31,31,30,31,30,31
350  PRINT "DO YOU WISH INSTRUCTIONS? N"; CHR$ (8);
360  GET R$
370  PRINT R$
380  ON R$ <  > "Y" GOTO 510
390  HOME : VTAB 2
400  PRINT "THIS PROGRAM PRINTS BLANK PLANNING"
410  PRINT "CALENDARS."
420  PRINT
430  PRINT "YOU MAY CONTROL THE FOLLOWING:"
440  PRINT "  - STARTING MONTH"
450  PRINT "  - STARTING MONDAY DATE"
460  PRINT "  - NUMBER OF WEEKS TO PRINT"
470  PRINT "  - SIZE OF CALENDAR BOX"
480  PRINT "  - NUMBER OF WEEKS BETWEEN BREAKS"
490  PRINT "  - PRINT A 5 DAY, 6 DAY, OR A 7 DAY"
500  PRINT "    CALENDAR"
510  DIM M$(12),M(12)
520  GOTO 530
530  FOR I = 1 TO 7
540  READ D$(I)
550  NEXT
560  FOR I = 1 TO 12
570  READ M$(I)
580  NEXT
590  FOR I = 1 TO 12
600  READ M(I)
610  NEXT
620  YR = 1985
630  PRINT "IS THE CURRENT YEAR ";YR;"? Y"; CHR$ (8);
640  GET R$
650  PRINT R$
660  IF R$ <  > "N" THEN 710
670  INPUT "CURRENT YEAR? ";R$
680  ON  NOT  VAL (R$) GOTO 670
690  YR =  VAL $(R$)
700  IF YR < 100 THEN YR = YR + 1900
710  INPUT "CURRENT MONTH? (1-12)";R$
720  ON  NOT  VAL (R$) GOTO 710
730  NM =  VAL (R$)
740  PRINT
750  INPUT "DATE OF MONDAY START? ";R$
760  ON  NOT  VAL (R$) GOTO 750
770  MS =  VAL (R$)
780  ON MS > 31 OR MS < 0 GOTO 750
790  PRINT
800  INPUT "NUMBER OF PLANNING DAYS? (5-7) ";R$
810  ON  NOT  VAL (R$) GOTO 800
820  WL =  VAL (R$)
830  ON WL < 5 OR WL > 7 GOTO 800
840  PRINT
850  INPUT "NUMBER OF WEEKS TO PRINT? ";R$
860  ON  NOT  VAL (R$) GOTO 850
870  NW =  VAL (R$)
880  PRINT
890  INPUT "NUMBER OF WEEKS PER BLOCK? ";R$
900  ON  NOT  VAL (R$) GOTO 950
910  BL =  VAL (R$)
920  PRINT
930  INPUT "SIZE OF SQUARE? (1-8) ";R$
940  ON  NOT  VAL (R$) GOTO 930
950  NL =  VAL (R$)
960  PRINT
970  IF NM > 2 THEN 1020
980  PRINT "IS THIS A LEAP YEAR? N"; CHR$ (8);
990  GET R$
1000  PRINT R$
1010  IF R$ = "Y" THEN M(2) = 29
1020  HOME
1030  VTAB 12
1040  PRINT "****POSITION PAPER AND PRESS A KEY****";
1050  GET R$
1060  PRINT R$
1070  PRINT  CHR$ (4);"PR#1"
1080  PRINT
1090  PRINT  TAB( 38);YR
1100  PRINT
1110  FOR K = 0 TO NW - 1
1120  IF K / BL =  INT (K / BL) THEN  GOSUB 250
1130  FOR I = 0 TO WL - 1
1140  IF  NOT F1 THEN  PRINT ":";MS + I; SPC( 19 - 2 *
      WL + (MS + I < 10)); M$(NM);:F1 = 1: GOTO 1230
1150  PRINT ":";MS + I; SPC( 22 - 2 * WL + (MS + I <
      10));
1160  IF MS + I = M(NM) THEN MS = 0 - I:NM = NM + 1:F1
      = 0
1170  IF NM = 13 THEN NM = 1:YR = YR + 1:F2 = 1
1180  ON WL - 4 GOTO 1190,1220,1230
1190  IF MS + I = M(NM) - 2 AND I = 4 THEN MS =  - 6:NM
      = NM + 1:F1 = 0
1200  IF MS + I = M(NM) - 1 AND I = 4 THEN MS =  - 5:NM
      = NM + 1:F1 = 0
1210  GOTO 1230
1220  IF MS + I = M(NM) - 1 AND I = 5 THEN MS =  - 6:NM
      = NM + 1:F1 = 0
1230  NEXT
1240  MS = MS + 7
1250  PRINT ":"
1260  GOSUB 130
1270  NEXT
1280  PRINT  CHR$ (4);"PR#0"
1290  END
```

A.P.P.L.E. Co-op SPECIALS
Prices Effective through August 15th

PRODUCT:
Panasonic KK-P1091 Printer
PRODUCT CODE:
HPANPT
PRICE:
$299.00
SHIPPING WEIGHT:
20 Lbs. 0 oz.

This highly rated printer is Epson RX-80 and IBM-PC dot matrix/graphics compatible. Prints 120 CPS and has a near letter quality mode.

PRODUCT:
Imaginator - Mach 3.5 package
PRODUCT CODE:
HPMACH
PRICE:
$229.00
SHIPPING WEIGHT:
4 Lbs. 0 oz.

Our new Mach 3.5 card makes the powerful Imaginator 3D graphics package even better. The processor intensive graphics routines will now run markedly faster as you examine different views and perspectives of your 3D objects. The Mach 3.5 card makes your Apple fly in other applications as well.

CALENDAR
Figure 1

1985

MON	TUE	WED	THU	FRI	SAT	SUN
23 DEC	24	25	26	27	28	29
30	31	1	JAN 2	3	4	5

1986

6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	FEB 2
3	4	5	6	7	8	9

MODEM PACKAGES

PRODUCT:
Apple II, IIe Modem Package
PRODUCT CODE:
SPMOD1
PRICE:
$499.00
SHIPPING WEIGHT:
7 Lbs. 8 oz.

Outstanding value! Regular separate Co-op price $593, retail $829! Includes Hayes compatible 1200 baud Multitech Multimodem AH2 with built-in 10 number phone list, Versacard (Serial, Parallel, clock functions), serial cable for connecting the versacard to the modem, and our versatile Modem Magician software package.

PRODUCT:
Apple IIc Modem Package
PRODUCT CODE:
SPMOD3
PRICE:
$399.00
SHIPPING WEIGHT:
6 Lbs. 0 oz.

Package includes Multitech Model AH2 1200 baud modem, connecting cable for your IIc, and Modem Magician software, all that you need to communicate.

PRODUCT:
Apple Macintosh Modem Package
PRODUCT CODE:
SPMOD4
PRICE:
$399.00
SHIPPING WEIGHT:
5 Lbs. 8 oz.

Package includes Multitech Model AH2 1200 baud modem and a connecting cable for your Macintosh.

Let the
HOME PROFESSOR™
put the power of the Apple II
family at your fingertips.

The HP is the best way to learn Applesoft * BASIC. Here's why:

1. Each lesson is on audio cassette. Listen & follow along with the work book while working at your computer.
2. The professor introduces BASIC commands, then illustrates their use in meaningful example programs.
3. Program development is structured. The problem is stated, a flowchart is constructed, code is written, then tested.
4. There are approximately 100 sample programs. They are useful for home or business. They are on diskette, so you don't waste time typing, you spend time learning.
5. There are 12 lessons. They build on each other. The topics range from getting started to random & sequential text files.
6. The result is, you'll have fun with your computer. You'll eagerly work through the lessons. You'll learn structured BASIC programming that will enable you to write satisfying programs. The power of your Apple will be at your finger tips!
7. Two week $ back guarantee.
8. Six audio cassettes (approx. 7 hours), 130 page workbook, & a double sided diskette.
9. All this & more for $79.95, plus $2 shipping. Tx. residents add 5.125% tax.

HARVEST SOFTWARE CO.
2014 Oak Shores Dr., • P.O. Box 5523
Kingwood, Texas 77339 • (713) 358-2364

DON'T DELAY, ORDER TODAY
CHECK - MCARD - VISA

Circle 63 on Reader Service Card

Imagewriter™ Owners

Congratulations, you own the professional-quality printer good enough for Apple™ to call their own. It is a printer whose software support is unriveled. Vilberg Brothers Computing, Inc. has produced software to *improve* your Imagewriter's image. It includes 24 character fonts and the software to download them to your Imagewriter or Apple DMP™. These characters, since they are downloaded, can be used by *ANY* Apple II program --- from AppleWorks™ to Visicalc™ And they don't slow down printing speed!!!

Match your characters to your task. Use Cyber for program listings, Typewriter for formal papers, and Script for personal notes. Use Bold to get attention, Super/Sub-script and Greek for scientific manuscripts, and Fat Face for notes to your friends. If our 24 character sets do not contain the image you need then convert character sets from Applesoft Tool Kit™, Beagle Brothers, Higher Text II™ or Penguin's Fonts using the Utilities. Still need more character sets? Then use the Utilities' font editor to create those characters you need.

Want to know more?
Read the review in Softalk (Feb 84). They called it *"excellent"* and described one of our Imagewriter fonts as *"near letter quality"*. Creative Computing (April 84) thought so highly of the DMP Utilities they called them *"a necessity"*. Find out for yourself. Circle the reader's service card and we'll send you an actual print sample. Then you can see the many images your Imagewriter can convey.

Vilberg Brothers Computing, Inc.
PO Box 4576, Madison, WI 53711-4576
(608) 274-6433

DMP Utilities costs $50. (WI res add $2.50 sales tax)
Apple, AppleWorks, Imagewriter, Applesoft Toolkit, and Apple DMP are trademarks of Apple Computer, Inc.
Higher Text II is a trademark of Synnergistic Software.
Visicalc is a trademark of Visi-corp.

Circle 78 on Reader Service Card

MacinTips—
Mac Up and Down

Ken Watters

WE will all agree, I am sure, that the Macintosh is a unique computer, and not the least of its unique features is its "user interface." It is also unique in the way it handles file transfers (uploads and downloads) via modem. Let's talk a little about the various types of files we might want to transfer, and how these are handled, Then we'll say a word or two about a terminal program that brings it all together in a very "MACish" way.

The most common type of file we might normally transfer is a text-file. This is the garden-variety ASCII file which just about all computers understand. If you have ever done any file transfers with an Apple II, or between different types of computers, you most likely used a text-file, whether what you put in it was text, BASIC program lines, hexadecimal characters, or whatever. With your Apple II, you would issue the "EXEC" command to make text files containing programs usable. A text file can be read by many utilities and most word processors, but for purposes other than sending straight text (such as MacWrite files saved in straight text format or Multiplan files saved in SYLK format) they are not of much use on the Macintosh.

Mac File Conversion

So how do we transmit and receive Macintosh programs and their unique files? Well, Mac stores its applications and their files in binary format, which is a little different than the hexadecimal format we were used to with the Apple II. In order to transmit and receive, we must do some conversion. Enter BINHEX! The BINHEX programs (there are a series of them, of which I believe the latest is V1.5) are available on CompuServe, and on many Public Domain disks. These perform the conversions for you, creating a HEX file for uploading from your BINary application, and a BINary application (complete with Icon) from your HEX file (actually a text-file) that you downloaded. BINHEX has a form of error-checking, in that it generates a checksum for an upload, and reads the checksum for a download to detect transmission problems. Using BINHEX is very simple. Just open it like any other application, and select either APPPLICATION → UPLOAD or UPLOAD → APPLICATION, depending on which way you want to go. It will inform you of the progress of the conversion, and of any problems. Hey, wait a minute, though! We're using a Macintosh here, right? Why should we have to go through all this technical stuff just to get a new MacPaint picture from a friend? Well, we don't! Read on . . . .

Terminal Software

Several popular terminal programs support an error-free protocol called "XMODEM." This is a way of transmitting files in small packets that are individually error-checked. If one packet is transmitted incorrectly, it is retransmitted until received correctly. A new format for Macintosh file transfers has recently come to light. Called Binary Format, or MacBinary, it uses XMODEM protocol, and is as simple and direct as the Mac itself. It is supported by at least one terminal program with the unlikely name of "Red Ryder," which is sold by the FreeSoft Company. More about this later. What MacBinary does is simply eliminate the need for any conversion. In order to transmit—or upload—a file or program ,one simply selects XMODEM Send, and the file is transferred. Period. Receiving a binary format file is just as simple— select XMODEM Receive and the program or file is placed on your disk, icon and all, data-perfect and ready to run. Simple and neat!

Now a word about Red Ryder. This is a very full-featured terminal program which is sold as "User-supported Software," otherwise known as Honorware. This means that you can get a copy of the program from CompuServe, or from a friend for free, legally. If you like it and use it, you are then expected to pay for it. However, for $40.00, this has to be one of the most incredible software bargains of all time. Its features include macros (the ability to define entire commands as one key), a sophisti-

cated auto-logon called Remote Service Procedures, several error-checking protocols (Kermit and XMODEM), and the above-mentioned Binary Format. It is very easy to use, makes full use of pull-down menus, supports a variety of baud rates, and is well supported by its author directly and on CompuServe. The best is yet to come: Red Ryder contains a "hidden" graphics driver which the author intends to support with a Bulletin Board program in the near future. This means that finally we will be able to do Mac-to-Mac communications using the familiar Mac desktop, icons, mouse, etc. The distant Mac will be like an extension of our own.

Red Ryder was written by Scott Watson, and is available from the Freesoft Company, 10828 Lacklink, St. Louis, MO 63114.

True to the spirit of the Macintosh, up-and-downloading has never been so easy, and it is getting easier!

We Goofed Last Month!

MacinTips for June 1985, pages 35-36, described how to construct a switchbox for sharing peripherals between a Mac and an Apple II. Unfortunately, the three figures published with that article were the wrong ones. Below are the correct figures for the June article. Sorry for any inconvenience this may have caused.

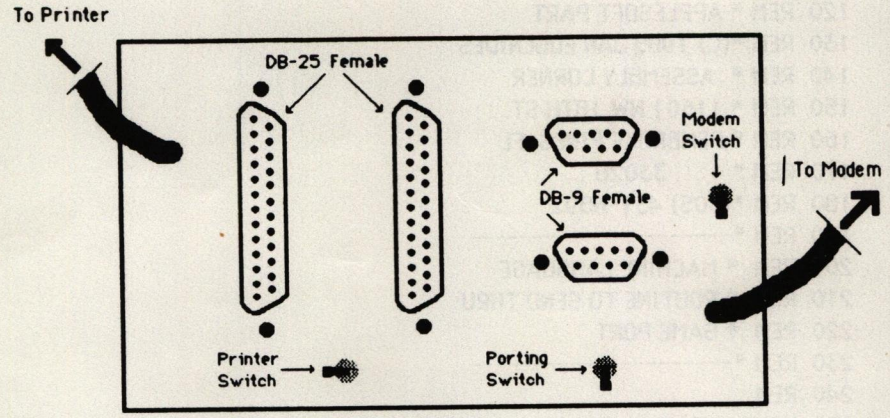


Fig. 1. Top view of switch box (not to scale)

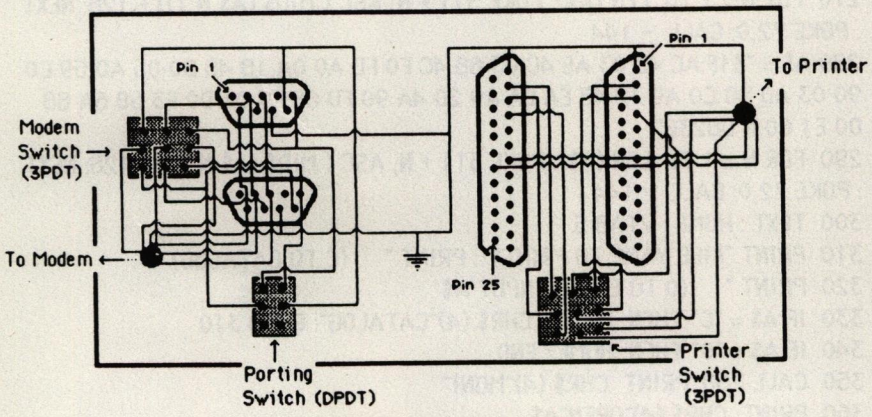


Fig. 2. Wiring Diagram (not to scale)
(Inside view)

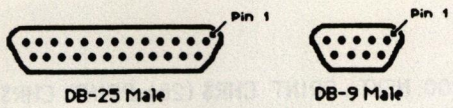
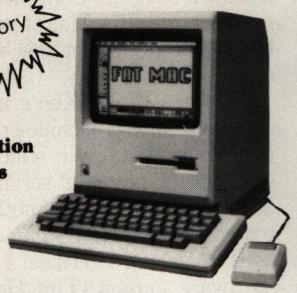


Fig. 3. Male DB Connectors

Up Your MAC to 512K with The MACBOARD

Upgrade your MacINTOSH™ to a full 512K with socketed memory. We ship you a complete, reworked board. Take out the old board, put in the new Macboard. After you make the swap, return your old board to us.

FREE Mac Memory Disc™ by Assimilation Process



Think of that, a 512K upgrade with:

- **No loss of use**
- **No shipping your MAC™**
- **120 day warranty**
- **FREE Mac Memory Disc™**
- **Immediate Availablity**
- **Big Savings**

Dealer Inquiries Welcome
Place Your Credit Card Order By Phone:
Call us, we'll ship C.O.D.

(213)207-8866

VOAD SYSTEMS™

12301 Wilshire Blvd. Suite 101
Los Angeles, CA 90025

™ MacINTOSH is a trademark of Apple Computer, Inc.
™ Mac Memory Disk is a trademark of Assimilation Process

Circle 79 on Reader Service Card

An Apple-to-Mac Connection

Jan Eugenides

AS a new Mac owner, I read with interest Ken Watters' article "Apple Wedding" in the April 1985 issue of *Call –A.P.P.L.E.* (page 31). I too wanted to send some data to the Mac from my Apple II. In particular, while I was waiting for my Mac modem to arrive, I wanted to be able to download some programs and information from MAUG on Compuserve, and then send them to the Mac. I was impatient to begin learning about this very interesting machine!

Unfortunately, Ken's method of connecting the two machines requires a serial interface for the Apple, which I don't have. I checked the prices of serial interfaces and decided there had to be another way. Then I remembered the lowly game port. It can be used as a serial interface! I called the local hardware genius (Tim Heffield) and he came over with some connectors, some wire, and a soldering iron.

After a couple of hours of playing with MacPaint and a few games of Daleks (I *had* to show off my new machine!), we finally got down to business. Once we did, it took Tim only a few minutes to rig up the connection. He says that sending data *to* the Mac *from* the Apple II is no problem at all, because the Mac's modem port is RS–232 compatible, which means that it will accept anything from a 3 to a 12 volt swing. The Apple game port puts out five volts, so that's no problem. Sending data *from* the Mac *to* the Apple would require a step down circuit of some kind to be sure that the Apple never got more than 5 volts, but I didn't need to send data that way anyway. The entire project cost me less than $3.00! See Figure 1 for wiring details.

Once the connection was made, a little programming on my part did the rest. Listing #1 is an Applesoft program which will send text files to the Mac, and Listing #2 is a Microsoft BASIC program which will receive the files and save them on the Mac's disk.

How to use it

To use the transfer programs, first type in Listing #1 on the Apple II, and Listing #2

LISTING #1

```
100 REM *--------------------
110 REM * APPLE/MAC CONNECTION
120 REM * APPLESOFT PART
130 REM *(C) 1985 JAN EUGENIDES
140 REM *  ASSEMBLY CORNER
150 REM * 11601 NW 18TH ST.
160 REM * PEMBROKE PINES, FL
170 REM *       33026
180 REM *(305) 431-6892
190 REM *--------------------
200 REM  * MACHINE LANGUAGE
210 REM  * ROUTINE TO SEND THRU
220 REM  * GAME PORT
230 REM *--------------------
240 REM
250 HOME : VTAB 10: PRINT "...LOADING SERIAL OUTPUT PROGRAM"
260 A$ = "300:A9 0C 85 36 A9 03 85 37 20 EA 03 60 8C 4D 03 8E 4C 03 48
C9 8D D0 05 20 29 03 A9 8A 20 29 03 N D823G"
270  FOR N = 1 TO  LEN (A$): POKE 511 + N, ASC ( MID$ (A$,N,1)) + 128: NEXT
: POKE 72,0: CALL  - 144
280 A$ = "31F:AC 4D 03 AE 4C 03 68 4C F0 FD A0 0A 18 48 B0 05 AD 59 C0
90 03 AD 58 C0 A9 12 48 EA EA A9 20 4A 90 FD 68 E9 01 D0 F3 68 6A 88
D0 E1 60 N D823G"
290  FOR N = 1 TO  LEN (A$): POKE 511 + N, ASC ( MID$ (A$,N,1)) + 128: NEXT
: POKE 72,0: CALL  - 144
300  TEXT : HOME : VTAB 5
310  PRINT "FILE NAME TO PRINT?": PRINT "     (C TO CATALOG)"
320  PRINT "     (0 TO EXIT)": INPUT A$
330  IF A$ = "C" THEN  PRINT  CHR$ (4)"CATALOG": GOTO 310
340  IF A$ = "0" THEN  HOME : END
350  CALL 768: PRINT  CHR$ (4)"MONI"
360  PRINT  CHR$ (4)"OPEN"A$
370  PRINT  CHR$ (4)"READ"A$
380  ONERR  GOTO 420
390  GET B$
400  PRINT B$;
410  GOTO 390
420  FOR X = 1 TO 200: NEXT : PRINT  CHR$ (26): PRINT  CHR$ (4)"CLOSE"
430  END
```

on the Mac. Wire up the connectors as shown in Figure #1. Almost any stranded copper wire will do, and the connectors are available at Radio Shack. Be sure you have the connectors wired up correctly, and be sure the DIP connector is properly plugged into the Apple. The little asterisk (pin 1) should go in the bottom right corner of the game port. **Warning: Plug things in while the machines are OFF!**

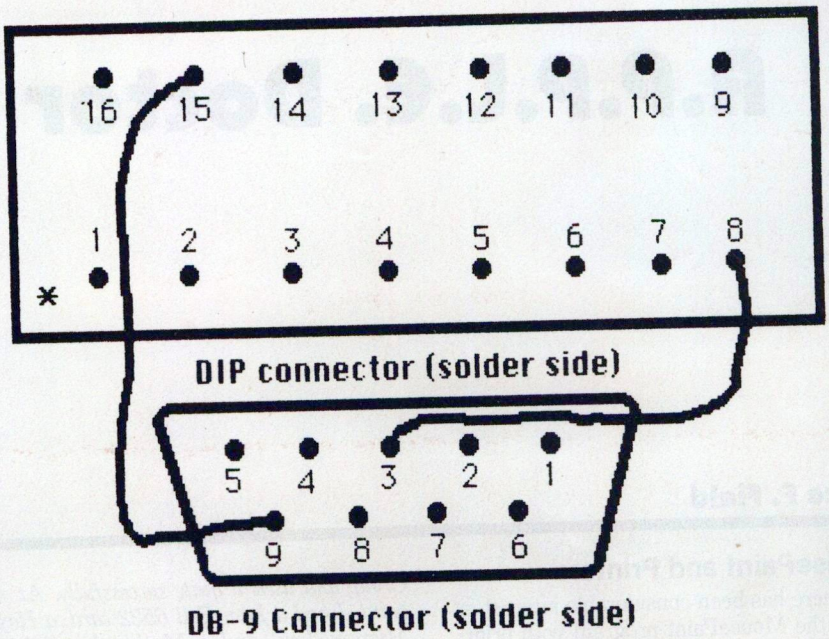
Get both programs running on both machines, and insert the disk with the file you want to transfer in the Apple II drive. It must be a text file. If you want to transfer a BASIC program, you must first convert it to text.

Your Apple will be asking you "Which file to print?," but don't tell it yet. On the Mac, select "Begin Capture" from the Capture menu. The Mac will ask you for a file name under which to save the captured file. Type in any legal file name and press RETURN. Now go back to the Apple II, type in the name of the file you wish to send, and press RETURN. The rest is automatic. The "Capture" menu bar will remain highlighted during the transfer, and when the transfer is complete it will go back to normal. Then you can send another file in the same way, or exit to BASIC or the desktop from the "Exit" menu.

After the first file has been sent, anything you type on the Apple will appear on the Mac screen, too. Nothing is being saved, but the connection is still turned on. To break the connection, press RESET on the Apple II.

That's all there is to it. A very easy (and cheap) way to send data from the Apple to the Mac. Once Tim figures out a step-down circuit (don't worry, I'll bug him until he does!), I'll write an article showing you how to send data from the Mac to the Apple II in the same inexpensive way.

Figure #1



Listing 2

```
'
'
' Apple/Mac capture program
' (c) 1985 Jon Eugenides
' Assembly Corner
' 11601 NW 18th St.
' Pembroke Pines, FL  33026
' (305) 431-6892
'-----------------------------------
' A program to capture files sent to the modem port
' from an Apple II using the Apple/Mac program
' See article for details
'-----------------------------------
Start:
   TEXTFONT 4        'Choose a mono-spaced font
   TEXTSIZE 9        'This size allows 80 characters per line
   TEXTMODE 1        'Set print mode to XOR

'-----------------------------------
' Set up menu bar
'-----------------------------------
   MENU 1,0,1,"Capture"
   MENU 1,1,1,"Start capture"
   MENU 2,0,1,"Exit"
   MENU 2,1,1,"Exit to Basic"
   MENU 2,2,1,"Exit to Desktop"
   MENU 3,0,0,""                    'Turn off other menus
   MENU 4,0,0,""
   MENU 5,0,0,""
   ON MENU GOSUB HandleMenu
   MENU ON
'-----------------------------------
' Set up modem port for 1200 baud, no parity, 7 bits, one stop bit
' With 2000 byte input buffer
'-----------------------------------
Set.Baud:
   OPEN "COM1:1200,N,7,1" AS 1 LEN=2000

Idle:
   a$= INPUT$(LOC(1),1)          'Print incoming chars on screen
   PRINT a$;
4 IF LOC(1)> 0 THEN GOTO Idle
   GOTO 4

HandleMenu:
   Menuchoice=MENU(0)
   Itemchoice=MENU(1)

   ON Menuchoice GOSUB Capture,Exitter
   MENU Menuchoice,0,1                'turn off menu bar
   RETURN

'-----------------------------------
' Get characters from modem port (COM1)
' Display them on screen, and save in file
'-----------------------------------
Capture:
   CLS
   PRINT:PRINT:PRINT:INPUT"Name of file to save";F$
   OPEN F$ FOR OUTPUT AS #2
Cap1:
   a$= INPUT$(LOC(1),1)
   IF a$=CHR$(26) THEN CLOSE #2: RETURN  'Ctrl-Z ends it
   PRINT a$;
   PRINT #2, a$;                      'Save in file
5 IF LOC(1)> 0 THEN GOTO Cap1
   GOTO 5

Exitter:
   ON Itemchoice GOSUB ExitBasic,ExitSystem
   RETURN

ExitBasic:
   MENU RESET
   STOP

ExitSystem:
   SYSTEM
```

APPLEWORKS FOR THE APPLE II+

The first patch program for the Apple II, II+, and Franklin that gives you appleworks with a 72K desktop capability (XM version)

Supports most major 80 column cards (viewmax, franklin videx and more)
One time configuration, no preboot required.
All functions available from **keyboard.**
72K of desktop space with most popular ram cards (Legend Saturn etc.) *requires XM version
PLUS-WORKS v1.0 (10K only) 19.95 + $3.00 ship
PLUS-WORKS-XM(ram card version) $49.95 + $3.00 shipping.

NORWICH DATA SERVICES ltd.
PO BOX 356
E. NORWICH, NY 11732-0356
(516) 922-9584
NYS add sales tax

Circle 70 on Reader Service Card

A.P.P.L.E. Doctor

Bruce F. Field

MousePaint and Printers

There has been considerable interest in using the MousePaint program with printers other than the Imagewriter (the only printer that is supported by the program). S. C. Kim Hunter wrote to describe a solution he developed to print Christmas cards, and I pass along some of his comments.

"Fontrix software by Data Transforms has a unique Virtual Memory system for multiple screen graphics which allows one to merge several graphic screens together for editing and simultaneous printing such that an entire printer page can be filled. But it has rather limited drawing ability, far below MousePaint. MousePaint can be used to create the screens which can then be transferred to Fontrix for printing, and Fontrix supports many printers, including the NEC 8023.

"My Christmas card consists of eight Apple graphic screens, two on each quarter page of the folded card. The Christmas tree on the front is two screens, done entirely with MousePaint. If you unfold the card, you see that the inside text is upside down on the page. I used the Fontrix Script font to generate the text, saved the Fontrix graphics screens, transferred them to MousePaint, used the "flip horizontal, flip vertical" commands to invert them, and then sent them back to Fontrix.

"Since MousePaint is ProDOS, and Fontrix is DOS 3.3, ProDOS Convert has to be used to transfer the files. Data Transforms says they don't have a ProDOS version, even though Apple, Inc. shows it on their list of ProDOS software. No doubt a ProDOS version will soon show up."

Switch-A-Slot Problem

Q. *Some time ago I purchased a Switch-A-Slot from Southern California Research Group and used it quite successfully. At one point, I had a John Bell 6522 card, a Hayes Micromodem, and a Mockingboard in it. Then I bought an Apple Mouse for my IIe. I cannot put the Mouse card in the Switch-A-Slot. If it is there, and the switch set to the Mouse card's location, fine. But, no other card in the Switch-A-Slot can be used! If the Mouse interface card is removed, no problems. If it is there, then no other cards can be used. As I understand it, the Switch-A-Slot has all cards connected to the Apple, but only applies voltage to the one selected. Have you any idea what the trouble is?*

A. It's difficult to tell exactly what the problem is without using some diagnostic equipment to look at the electrical signals, but what is apparently happening is that the Mouse card is pulling one or more of the signal lines low, even when it is not powered, interferring with the operation of the other cards. Even if we know exactly which signal line is causing the problem there is no simple solution. The only alternative is to rearrange your cards so that the Mouse card can be put inside the Apple and a card that is compatible with the Switch-A-Slot be moved there. At least you have sounded a warning to other potential users of Switch-A-Slot.

ProDOS vs DOS 3.3

Q. *What are the advantages in upgrading my Apple IIe from DOS 3.3 to ProDOS?*

A. There are actually no modifications that have to be made to your hardware to use ProDOS. (Apple II and II+ owners must have a Language card installed.) Commercial programs that run under ProDOS will come with a copy of ProDOS on the disk and you boot it like any other disk. You won't know the difference. If you wish to write your Applesoft programs using ProDOS, you will need the ProDOS User's Kit, and the disk and manual available from your dealer.

The advantage of ProDOS is speed in loading and saving programs and files. Although ProDOS uses the language card you will still only have about 36K of memory left for Applesoft programs after loading ProDOS. ProDOS has a special garbage collection function that works much faster than Applesoft. ProDOS also supports pathnames and directory files to make it easier to use a hard disk that contains hundreds of files. A directory file is another catalog that contains the names of files associated with that directory. In ProDOS you can have a number of separate directories each with it's own list of files. To make things even more complicated, directories can also contain the names of other directories. A pathname is a road map from the disk volume name to the file, through the directory names. For example, MYDISK/LETTERS/GEORGE is a pathname that looks for the file GEORGE in the directory LETTERS on the disk MYDISK. ProDOS will look in both drives (if you have two) to find the disk MYDISK; you don't have to tell it where the disk is physically located. If you have the extended memory 80-column card (the one with the extra 64K of memory) in your IIe (all IIc's have this card), you can use it as a Ram Disk. Instead of saving to a slow disk, you can use the memory on the card as a fast temporary disk.

Sideways with Imagewriter

Q. *Is there any way to change the Imagewriter to print sideways without using a program like "Sideways"?*

A. No. The Imagewriter and all other dot matrix printers that I know of are designed to print only in the normal way. To get other kinds of printing, special programs must be used that generate graphics characters and use the printer in the graphics mode.

Switching Cards

Q. *In changing from an Apple II+ to a IIe are the old peripheral cards transferrable (Micromodem II, Softcard, Parallel printer card)? Can damage be done when using a trial and error method?*

A. Almost all cards that work in a II or II+ should work in the IIe. There might be some minor problems with the software on the card not being compatible with the IIe software stored in ROM, but this will not cause any damage. Just make sure that you have the power off when you insert or remove any cards or I guarantee you will generate lots of damage.

Spreadsheet Consolidation

Q. *Is there any way to consolidate several*

spreadsheets into one automatically using the spreadsheet functions in AppleWorks?

A. There doesn't appear to be any way to consolidate spreadsheets with the formulas intact. You can print the spreadsheets to DIF files and load them back in, but you get only the text and numbers, you lose the formulas. You could also print to the clipboard and load multiple spreadsheets into the word processor. This is a one way street, as it is not possible to go back from the word processor to the spreadsheet. I think your only solution is to type in your spreadsheet again.

Locked into Lower Case

Q. *I have just updated to an Apple IIe. On my old II+ I used a word processor that expected a "shift-key mod" to enter upper and lower case characters. Obviously, the IIe doesn't need a shift-key mod. The word processor now only generates lower case!* Help! *What do I do?*

A. Some word processors have a mode where they can be locked into upper case only characters. After you do this, release the caps lock key on your IIe and see if you don't get proper upper and lower case using the shift key normally. If not, it's time for a new word processor.

Sorting Backwards

Q. *When using the Super File Cabinet program which uses the machine language Ampersort routine, I'm finding that Ampersort is failing to sort two digit numbers correctly, i.e. 20, 3.1, 1.6 are sorted to 3.1, 20, 1.6). How can I fix this?*

A. Don't sort those numbers. Seriously, Ampersort only sorts strings of characters and doesn't know or care if they are actually numbers. Each character in the string is represented by an ASCII code value and Ampersort uses these code values to do the sort. In your example, the two characters 2 and 0 are ASCII 50 and 48, 3.1 is ASCII 51, 46, and 49, 1.6 is ASCII 49, 46, and 54. (These values can be found by looking up the characters in any ASCII table.) In your example, you appear to be sorting in reverse alphabetic order, from highest ASCII value to lowest, rather than lowest to highest as is normal. In any case, the highest valued first character is 51 so 3.1 comes first, next is 50 so 20 comes next, last is 49 thus 1.6 is last. When Ampersort is used like this, it is not possible to correctly sort numbers that contain decimal points.

Don't Stop to POKE

Q. *In BASIC, when EXECing a DOS file which starts with a number, there is a point in time when disk I/O has stopped and the ASCII code in the file resides in a buffer, but nothing has been done with it. The code will then be passed by DOS to the Interpreter and converted into a BASIC line. Why can the user not*

CONVERSE WITH YOUR COMPUTER

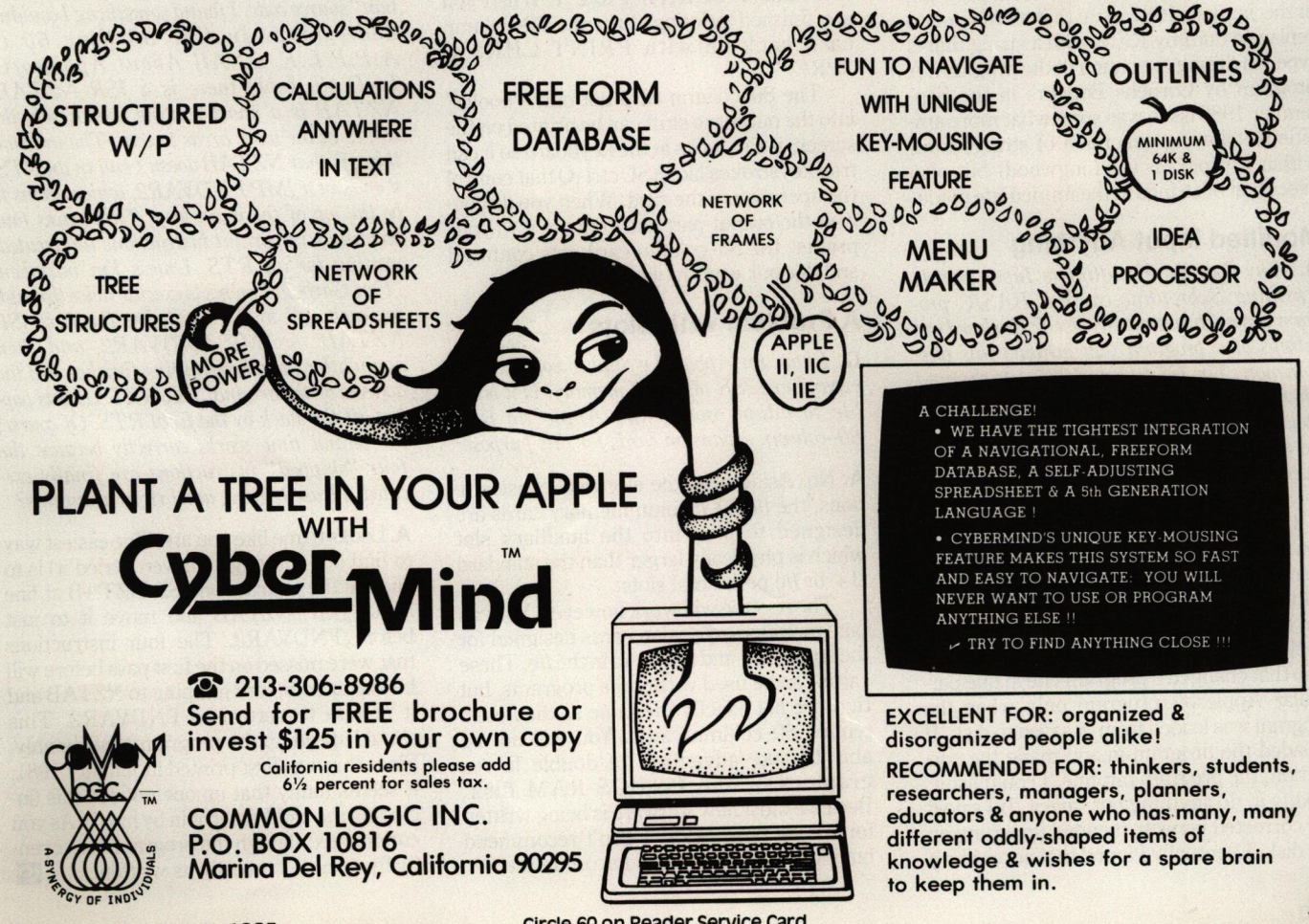
AT LAST! A FULL IMPLEMENTATION of the original ELIZA program is now available to run on your Apple computer!
Created at MIT in 1966, ELIZA has become the world's most celebrated artificial intelligence demonstration program. ELIZA is a non-directive psychotherapist who analyzes each statement as you type it in and then responds with her own comment or question—and her remarks are often amazingly appropriate!
Designed to run on a large mainframe, ELIZA has never before been available to personal computer users except in greatly stripped down versions lacking the sophistication which made the original program so fascinating.
Now, our new Apple version possessing the **FULL** power and range of expression of the original is being offered at the introductory price of only $25. And if you want to find out how she does it (or teach her to do more) we will include the complete **SOURCE PROGRAM** for only $20 additional.
Order your copy of ELIZA today and you'll never again wonder how to respond when you hear someone say, "Okay, let's see what this computer of yours can actually do!"

READ WHAT THE EXPERTS SAY ABOUT OUR VERSION OF ELIZA:
"Much more than a mere game...You'll be impressed with ELIZA... A convincing demonstration of Artificial intelligence." —*PC MAGAZINE*
"Delightful entertainment... An ideal medium for showing off your system." —*MICROCOMPUTING MAGAZINE*
"ELIZA is an astounding piece of software... A fascinating program to use and study." —*BARON'S MICROCOMPUTER REPORTS*
"ELIZA is a great way to introduce your friends to computers... A very funny party game." —*PETER A. McWILLIAMS*
"ELIZA is an exceptional program, one that's fun to use, shows off your machine, and has great historical interest." —*POPULAR COMPUTING MAGAZINE*
"This version of ELIZA is the best we have seen. As a party game, it is unmatched." —*HOME APPLICATIONS FOR THE C-64*

ELIZA IS AVAILABLE IN THE FOLLOWING FORMATS:
1. Protected Version **$25**
(Protected Version can be run but not listed or modified)
2. Un-protected Applesoft BASIC Source Version **$45**
(Source Version can be listed and modified as well as run)
Both versions include a six page user manual and will run on Apple II, Apple II+, Apple IIe and Apple IIc.
Source Version also available for Macintosh if you have Microsoft BASIC.
Please add $2.00 shipping and handling to all orders.
(California residents please add 6½% sales tax)

ARTIFICIAL INTELLIGENCE RESEARCH GROUP
921 North La Jolla Avenue, Dept. X
Los Angeles, CA 90046
(213) 656-7368 (213) 654-2214
MC, VISA and checks accepted

Circle 54 on Reader Service Card



PLANT A TREE IN YOUR APPLE WITH CyberMind™

A CHALLENGE!
- WE HAVE THE TIGHTEST INTEGRATION OF A NAVIGATIONAL, FREEFORM DATABASE, A SELF-ADJUSTING SPREADSHEET & A 5th GENERATION LANGUAGE !
- CYBERMIND'S UNIQUE KEY-MOUSING FEATURE MAKES THIS SYSTEM SO FAST AND EASY TO NAVIGATE: YOU WILL NEVER WANT TO USE OR PROGRAM ANYTHING ELSE !!

↙ TRY TO FIND ANYTHING CLOSE !!!

EXCELLENT FOR: organized & disorganized people alike!

RECOMMENDED FOR: thinkers, students, researchers, managers, planners, educators & anyone who has many, many different oddly-shaped items of knowledge & wishes for a spare brain to keep them in.

☎ 213-306-8986
Send for FREE brochure or invest $125 in your own copy
California residents please add 6½ percent for sales tax.

COMMON LOGIC INC.
P.O. BOX 10816
Marina Del Rey, California 90295

COMMON LOGIC™ A SYNERGY OF INDIVIDUALS

Circle 60 on Reader Service Card

POKE the ASCII values into the same buffer, set the appropriate pointers and flags, and change a running Applesoft or Integer Basic program "on the fly" without extra machine language routines? I have tried everything I can think of to accomplish this without success. Any suggestions?

A. Your explanation of how BASIC program lines get EXECed into an existing program is mostly correct. One key point you have neglected is that in order for the interpreter to input program lines it must not be running a BASIC program. The interpreter can either be in the command mode where it displays a prompt and is waiting for commands or program lines to be typed in, or it can be in the run mode, running the BASIC program. When DOS EXECs a file, it temporarily sets the interpreter to the command mode, "POKEs" the BASIC line into the keyboard buffer, calls the interpreter to parse (convert) the line, and then start the program running again from where it left off. If you stop the BASIC program from running, you can't use POKE to tell the interpreter to parse the line in the buffer. How can you execute Applesoft instructions if Applesoft isn't running? You will always need some kind of machine language program (DOS for example) that can perform this function.

Two articles have appeared in *Call -A.P.P.L.E.* that discuss machine language programs to add lines to running Applesoft programs. David Lingwood had a program in the January 1981 issue that allows you to replace a dummy REM with a string that is typed in during execution of the program. A program by Cornelis Bongers in the September 1982 issue was somewhat more ambitious, allowing execution of strings from within a program (as Lingwood) but also execution of strings in the immediate mode.

Modified Input Anything

Q. *Why does the Penultimate Input Nearly Anything Subroutine cause a BASIC program to sometimes modify itself? Enclosed are listings of a program that exhibits this phenomenon. The G$ in line 5085 gets changed when the program is run. During the trouble shooting process, it was noted that the change did not occur until the variable I in line 5180 reached the value of 6.*

A. I have looked over the program listings you sent and don't see anything wrong with them. I suspect that you may have a hardware, i.e. memory, problem. Memory errors can be particularly troublesome and hard to track down. On my //e, I had a bad memory chip that changed a program line in one particular Applesoft program only when the program was loaded from or saved to disk. If I loaded the program in and made the correction, the program ran fine. I could list it, modify it, do anything but save it. If I saved the corrected version, it ended up wrong on the disk. Eventually I found that accessing a certain memory location (one that DOS happened to use) caused another completely different location to be changed—weird! A clue that it might be a hardware problem is that you call the input routine in line 5090 before any changes occur in the program. By the time you get to line 5180 where you say the change happens, you aren't using the input routine at all. Try running your program on a different computer and see if the problem still occurs.

A Card Problem

Q. *I have a problem with printer interface cards and perhaps you could provide a solution. My system is an Apple //e with extended 80-column card. I have a Microtec Dumpling-64 parallel card in slot #1 and an Apple Serial card in slot #2. The only case where the serial card will not work is from a BASIC program or keyboard, using the "PR#" command, with the 80-column card installed. This is the case with both DOS and ProDOS. I would very much appreciate knowing if there is a way to get this configuration working from BASIC.*

A. According to the Apple manual for the 80-column card, you must first turn the card off before you can use a printer. To do this from Applesoft use the following command, PRINT CHR$(21). This turns the 80-column card off and puts you back in the 40-column mode. You should now be able to use your printer with the PR#2 command (i.e. PRINT CHR$(4)"PR#2"). When you are finished printing, turn the 80-column card back on with PRINT CHR$(4) "PR#3".

The 80-column card not only "hooks" into the output so stuff can be printed on the screen, it also looks at the keyboard so it can trap keystrokes like ESC ctrl-Q that control the operation of the card. When you disconnect the output part and connect it to your printer, the 80-column card gets confused and doesn't want to work properly.

A Problem with Slots

Q. *I have an Apple II+ that I would like to expand to 128K of RAM memory. Is it possible to adapt one of the Apple //e 64K 80-column expansion cards for this purpose?*

A. No. Aside from the electrical considerations, the //e 80-column memory cards are designed to plug into the auxiliary slot which is physically larger than the standard II+ or //e peripheral slots.

The reverse will work however. You can take memory expansion cards designed for the Apple II+ and use them in the //e. These cards can be used with some programs, but they are not exactly the same as the //e extended 80-column cards. You will not be able to take advantage of double hi-res graphics or the ProDOS RAM disk. Because most new software is being written for the //e type cards, I don't recommend buying the old II+ cards for use in the //e.

A Question of Resolution

Q. *Are the new ROMs (for the enhanced //e) any easier to read?*

A. No, the new character generator ROM has replaced some of the lesser used characters with special graphics characters that are useful for drawing boxes and whatnot on the text screen. These characters are used with, among other things, the Apple Mouse to create Mac-like pull down menus and dialog boxes. The basic resolution of the Apple, which mostly controls the readability, remains at 280 dots horizontal by 192 dots vertically in the text mode.

A Couple Good Books

Q. *What is a good book for learning about the "inner workings" of DOS 3.3 or ProDOS?*

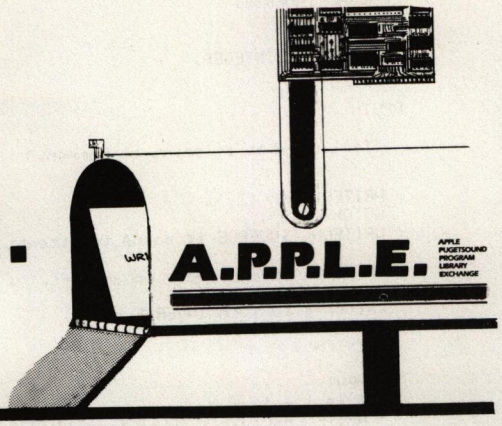
A. *Beneath Apple DOS* and *Beneath Apple ProDOS* by Don Worth and Pieter Lechner (published by Quality Software) are probably the best books on the subject. They have some information that is useful for beginners who want to know how DOS works, as well as more detailed information useful for machine language programmers.

GARBAGE COLLECTION BUG

Q. *After reviewing the "Fast Garbage Collection" source code, I found something I couldn't understand. In line 59 (line 60 in A.P.P.L.E.'s "All About Applesoft" In-Depth book) there is a JSR NZTAB. NZTAB is a short routine which sets the values in the work areas to zero. The unusual thing is that NZTAB doesn't end in an RTS, it ends in a JMP FNDVAR2, which seems to be the top of the main loop. This leaves four seemingly important instructions unexecuted, waiting for an RTS. Unless I'm mistaken, "Fast Garbage" seems to execute twice through for each call to it—once after the first JSR NZTAB... JMP FNDVAR2, and then again after the whole routine finishes and the address of the original JSR NZTAB gets popped off the stack by the final RTS. Of course, the second time works correctly because the four "skipped" instructions are finally executed. Please tell me, am I right about this?*

A. Looks to me like you are. The easiest way to find out (although I haven't tried it) is to change the instruction JSR NZTAB at line 59 to JMP NZTAB and move it to just before FNDVAR2. The four instructions that were missed on the first pass before will be executed before jumping to NZTAB and it is safe to return to FNDVAR2. This should speed up the program considerably. Since this was first printed in January 1981, it seems funny that no one noticed this (including me and I typed it in by hand). As you commented though the program does eventually operate correctly as written.

Write—A.P.P.L.E.



Readers' forum

MouseText —Apple's Last Word?

In the May 1985 *Call –A.P.P.L.E.*, Ken Kashmarek discussed our new graphic characters for producing Filecard and Desktop software. These characters collectively are called "MouseText." This is all one word, rather than the two-word version Mr. Kashmarek used in twelve of the thirteen instances in his article. This use of two words was rather wasteful: the single-word version saves one byte in your word processor each time you mention MouseText, as you needn't store the intervening space. In Mr. Kashmarek's case, he would have saved over 11 bytes! (Actually, this is not the real reason we left the space out of the name, but it is certainly as compelling as the real reason.)

Many people have been confused about my plunking down these characters right in the middle of the upper-case inverse characters. There is no logical explanation for this behavior, but there is a weird and twisted reason. We have pretended to have two character sets in the Apple *//e*: the old Apple II character set and the new "Alternate" character set. Actually, there is only one set of characters: our custom chips create the illusion of the old character set out of the new one. For example, a flashing character "A" on the Apple *//e* is actually this chip alternately displaying a normal "A" character, then an inverse "A" character, and so forth.

The problem is that instead of displaying the regular old inverse "A" character, it actually displays the control-inverse "A" character. This always worked as long as the control characters looked just like the upper-case characters, but when I tried putting MouseText where it belongs (0–$1F), flashing characters in the old Apple II set took on a most unusual appearance: a flashing "A" became a normal "A" alternating with an Apple.

Therefore, the MouseText characters ended up in the middle of the upper-case set. Of course, since we changed the video firmware to handle the change properly, and since every developer *always* goes through our published entry points...

Well, there were just a few programs out there that didn't do things the Apple way. (One of them was Apple's own, but that is another story.) So, if you do find strange chicken-tracks in place of some inverse text in your favorite program, do not panic! Nothing is wrong with your computer. If it is bad enough to bother you, simply get an updated version of your program. Virtually all the developers who experienced a problem with MouseText on the *//c* have long since upgraded their program, and they have a process in place for you to get a copy of the upgraded program at a reasonable cost, often with much improved overall features and performance.

Now, for you programmers: please do go through our published entry points. This was the fourth time since I have been at Apple that we have changed a hardware or software feature such that the people who followed the rules were O.K. and the others were blown out of the water. We don't do it on purpose; we are evolving the computer and that requires making changes that will affect software. That is why we publish the entry-points that we will keep safe. Use them!

Something else programmers using MouseText will want to know is that the MouseText Running Man, characters 70 and 71 (characters $46 and $47 for those of you with 16 fingers) has fallen on hard times. Steve Jobs told me when I designed the set that he (the Running Man, that is) was silly and spurious, and, as much as I hate to admit it, Steve was right. I am therefore herewith declaring that the Running Man is an officially "reserved" pair of characters: at any time we choose, we could change him to a sleeping elephant, or some other equally ridiculous choice. (Please do not send suggestions.) We may never change him, but if you program professionally, avoid using him. If you program for yourself, feel free to let him run around: he will always be there for you on your own computer.

Finally, for everyone: The promise of the MouseText character set and the video firmware chips that support it is a new era of lightning-fast, visually stimulating software. As the base of users that have MouseText increases, developers are beginning to write a new generation of consistent, user-friendly software. How can you help usher in the new generation? Right now developers are watching to see how many of you go out and enhance your system. They want everyone to have MouseText, and they want everyone to have 128K. The more of you who do, the more and faster they will publish. So *//e* owners unite, and bring your systems up to the level of the *//c*. (Did I say something wrong?) Then hang onto your hats, because the next few years are going to get really interesting!

Bruce Tognazzini
Apple Computer, Inc.

Fastfind Bug Fix

I received my copy of Call –A.P.P.L.E. Fastfind recently and found that it would not run on my Apple with the "old monitor" ROM. The problem is a call to the Autostart monitor's routine that "OK's" modified reset vectors so that DOS will not be rebooted when reset is pressed. This routine does not exist in the "old monitor" ROM, so the program hangs when you boot the Fastfind disk on an Apple with this ROM.

The solution: Create a version of Fastfind that calls the monitor routine only if the Autostart ROM is present.

Procedure: LOAD FASTFIND, remove the CALL 37152 statement in the middle of line 300, add the following statement at the end of line 300: IF PEEK (64367) = 173 THEN CALL 37152.

Now UNLOCK FASTFIND, SAVE FASTFIND, LOCK FASTFIND.

Phil Bryan
529 West St.
Park City, IL 60085

Dear Phil,

Your fix to FASTFIND was very inventive, but it causes another problem by increasing the size of the program so that, under certain circumstances, a load by LTXT would cut off the top of the variable storage area.

A better fix for your machine would be to merely delete the CALL 37152 statement from line 300. We do not recommend adding the PEEK stuff because it can cause a crash.

Enclosed is a disk containing a new FASTFIND, (version 1.3J), which eliminates the problem by not calling the Autostart monitor routine. Val Golding suggested the solution, but I cannot test it since I do not have access to an old Apple II.

Please let me know how it works on your computer.

Jim Hammond
FASTFIND CO.
28503 Coveridge Dr.
Rancho Palos Verdes, CA 90274

Pascal INVERSE Tester

The book *Call -A.P.P.L.E.—In Depth All About Pascal* has an article "INVERSE, FLASH AND LOWER CASE DISPLAY" by David Lieberman that tells you how to get INVERSE, FLASH and LOWER CASE text displays.

The technique presented calls for the BIOS to be modified. The technique is limited because INVERSE and FLASH can display upper case letters only.

The program I am presenting will attempt to find a pair of control characters (CHR(0) thru CHR(31)) that can be used to turn INVERSE display ON and OFF.

The control characters found can be used to turn INVERSE display ON and OFF by writing the characters before and after the text that you want to be displayed in INVERSE. For example, if CHR(15) turns INVERSE ON and CHR(14) turns INVERSE OFF, then the line WRITELN-(CHR(15),A,CHR(14)); will display A in INVERSE.

I am able to display all characters in INVERSE with my hardware. (PowerCase lower case chip from BEAMAN PORTER, INC., and VIEWMAX-80, 80 column card from Micromax. The VIEWMAX-80 is upward compatible with the Videx Videoterm 80 column card.)

Keith A. Van Wagner II

```
PROGRAM INVERSE;

VAR
  I, HOLDI :INTEGER;
  C :CHAR;

BEGIN

  {Tell us what is going to happen.}

  WRITELN(CHR(12));
  GOTOXY(0,0);
  WRITELN('INVERSE is going to attempt to find the code that turns');

  WRITELN('inverse mode on and off.');

  {Attempt to turn INVERSE on.}

  C := 'N';
  I := -1;
  REPEAT
    I := I + 1;
    WRITE(CHR(I),'Is INVERSE on (Y/N)? '); READ(C); WRITELN;
  UNTIL (I = 32) OR (C = 'Y') OR (C = 'y');

  {Deliver exit message, if needed.}

  IF (C <> 'Y') AND (C <> 'y') THEN
    BEGIN
      WRITELN('It appears that you will not be able to use INVERSE,
sorry.');
      EXIT(PROGRAM);
    END;

  {Save INVERSE value}

  HOLDI := I;


{Tell us what is going to happen.}

WRITELN(CHR(12));
GOTOXY(0,0);
WRITELN('You will be able to turn INVERSE on.');
WRITELN('Now, we must find the code to turn INVERSE off.');

{Attempt to turn INVERSE off.}

C := 'N';
I := -1;
REPEAT
  I := I + 1;
  WRITE(CHR(I),'Is INVERSE off (Y/N)? '); READ(C); WRITELN;
UNTIL (I = 32) OR (C ='Y') OR (C = 'y');

{Deliver exit message, if needed.}

IF (C <> 'Y') AND (C <> 'y') THEN
  BEGIN
    WRITELN('We are unable to turn INVERSE off.');
    WRITELN('You may have to turn your APPLE off then on to get your');
    WRITELN('normal display back.');
    EXIT(PROGRAM);
  END;

{Tell the user what values were found.}

WRITELN(CHR(12));
GOTOXY(0,1);
WRITELN('The character CHR(',HOLDI,') turns INVERSE on.');
WRITELN('The character CHR(',I,') turn INVERSE off.');
END.
```

There were a couple of errors in the Write -A.P.P.L.E. section of the April 1985 issue. These occured under the heading *Interfacing Appleworks and Prowriter.* A bracket in the table was incorrect. It should appear as follows:

Menu Option	Keystrokes
Boldface Begin	ESC ! SHIFT 6
Boldface End	ESC " SHIFT 6
Subscript Begin	ESC [ESC T12 CONTROL J

The third to the last paragraph was missing text. The paragraph should read:

I wanted to be able to make my printer do double width printing and Appleworks has no option for this so I decided to use 5 CPI to represent double width on and 6CPI to be double width off. I used the 4 CPI to represent proportional. 17 CPI is condensed mode (132 characters).

ScreenWriter //e Improvements

I read with interest Rick Sutcliffe's review of word processors in the October 1984 issue. I agree completely with his comments on the "improvements" to the ScreenWriter //e version. Here is a copy of my letter to On-Line Systems, describing a fix for this problem:

Gentlepeople:

I recently got your ScreenWriter update for the //e. I am generally very pleased with it, except for one thing:

There is no way to define macros to replace sequences like Escape—Shift—Z and Escape—Shift—P. This is very unfortunate, since I use these a lot, and they are awkward.

This was not a problem with ScreenWriter II+ with the shift key mod. So, in this area, the //e version is not as good.

I then called and talked to Tech Support on the phone. While the lady was very polite, she said that there was no way to cure this problem. So, being frustrated, I examined the macro tables to see how they are put together, and tried some experiments. Lo and behold, there is a way! Furthermore, it does not involve peeking at or changing the ScreenWriter code in any way, and it can be done by a non-hacker.

I am sending this to you in hope that you will use it to help out people in a similar situation. Perhaps you could expand it a bit and sent it out the way you send out the temporary patches for the //e shift key.

Here are the instructions, in somewhat condensed form. In this example, I am changing the Ctrl-O key to do "page up," or Esc-Ctrl-P. The same technique can be used to change any key or combination of keys.

See opposite side for list of advertisers

MORE INFORMATION about the products and services in this issue FREE!

Just circle the number and fill out the card. (Note: card expires three months following month of publication.)

Act Now! Join! A.P.P.L.E.

Apple **P**ugetSound **P**rogram **L**ibrary **E**xchange

The **World's** Largest Computer Co-op

- 12 issues of Call-A.P.P.L.E. magazine. The nation's premier Apple computer publication.
- Co-op buying power. Discounts and dividends.
- Free HOTLINE information service. Technical help for those tough questions.
- Public Domain Software. Thousands of titles for many uses at a cost of less than 20¢ each title.
- Free Bulletin Board Service. Telecommunication service for members and discounts to the Source.

ALL THESE BENEFITS AND MORE FOR ONLY $49!

Detach and mail the Business Reply Application Form.

→

or call:
1-800-426-3667
(ask for our latest special)

Call-A.P.P.L.E. normally sent by second class mail in the U.S.

For foreign memberships/subscriptions or first class mail, please write to request information about additional postage rates.

READER SERVICE CARD
Free Information on the Items circled

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150

SURVEY

What one computer do you currently use most?

A ☐ *Apple II*
B ☐ *None*
C ☐ *Apple IIe*
D ☐ *Other (specify)*

What hardware product are you most likely to buy in the next 4 months?

E ☐ *Hard Disk*
F ☐ *5 megabyte*
G ☐ *10 megabyte*
H ☐ *20 megabyte*
I ☐ *8086 board for your Apple (run IBM P/C software)*
J ☐ *Apple keyboard (increase capability)*

What computer language would you likely purchase in the near future?

K ☐ MBASIC.MAC
L ☐ PASCAL
M ☐ MODULA 2
N ☐ ADA
O ☐ LISP
P ☐ C

Name _____
Company _____
Address _____
City _____
State _____ Zip _____

Card Expires 9/30/85

7/85

Call—A.P.P.L.E. Reader's Choice

Help us help you. By filling out and returning this card, marked with your preferences, you can guide us in selecting material tailored to your needs. Just place the numbers from 1 to 10, in order of preference, in the appropriate boxes. Please do not choose more than 10 features. A.P.P.L.E. members who include their membership number will have their names placed in a drawing for $100 credit toward any A.P.P.L.E. product. Drawing will be held Sept. 17, 1985 The top scoring author will also receive a $100 cash bonus.

☐ **Apple Computer Incorporated: An Inside View** Quincy Flugelheidt
☐ **Adjustable Planning Calendar** Harold Shuckhart
☐ **The INNER CIRCUIT** Don Elman
☐ **Floating-point Arithmetic in Applesoft BASIC** James W. Thomas
☐ **MacinTips—Mac Up and Down** Ken Watters
☐ **Planting a Seed** Peter C. Weiglin
☐ **SANE Programming on the Apple** J. B. Koons
☐ **An Apple-to-Mac Connection** Jan Eugenides
☐ **Member Billboard** Don Elman
☐ **The Secrets of Apple Writer's WPL — Part 2** Richard Loggins
☐ **A.P.P.L.E. Doctor** Bruce F. Field
☐ **The Marketplace** New products
☐ **THE Spreadsheet as Cabinetmaker** John Geddis
☐ **Write -A.P.P.L.E.** Readers' forum
☐ **Unclassifieds**

Name _____ Address _____ Memb. # _____

A.P.P.L.E. employees ineligible for prizes. Void where prohibited by law.

7/85

☐ Please send me an A.P.P.L.E. Apple-cation and information.
☐ $49.00 payment enclosed.
☐ Mastercharge / Visa

$23.00 First time fee
$26.00 First year dues
$49.00 Total

MasterCard # _____ Exp. Date _____

VISA # _____ Exp. Date _____

Name _____

Address _____

City _____ State _____

Zip _____ Phone _____

Apple PugetSound Program Library Exchange
The WORLD's Largest Apple Computer User Group
A.P.P.L.E. • 290 S.W. 43rd Street • Renton, WA 98055 • (206) 251-5222

7/85

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY CARD
FIRST CLASS PERMIT NO. 217 CLINTON, IA

POSTAGE WILL BE PAID BY ADDRESSEE

Call-A.P.P.L.E.
P.O. Box 1993
Clinton, IA 52735-1993

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY CARD
First Class Permit No. 450 Renton, WA

POSTAGE WILL BE PAID BY ADDRESSEE

Call-A.P.P.L.E.
290 S.W. 43rd St.
Renton, WA 98055

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY CARD
First Class Permit No. 450 Renton, WA

POSTAGE WILL BE PAID BY ADDRESSEE

A.P.P.L.E.
290 S.W. 43rd St.
Renton, WA 98055

Advertiser Index

Reader Service Number		Page Number
50,51,52	Applied Engineering	2,7,30
53	Apricorn	52
54	Artificial Intelligence Research Group	39
55	Axlon	14
56	Beagle Bros.	26,27
57	Blankenship Associates	16
58	Central Point Software	17
59	Colt Valley Computers	6
60	Common Logic	39
61	David Data	20
62	Digital Vision	18
63	Harvest Software	34
64	hot Cider	4
65	Human Systems Dynamics	51
66,67	Interactive Microware	13,20
68	Laing Electronics	23
69	Memory Plus Distributors	47
70	Norwich Data Services	37
71	Orbital Systems	45
72	Prof. Jones	22
73	Roger Wagner Publishing	24
74	Softwear Company	45
75	Southern California Research Group	11
76	10/10 Software	18
77	VF Associates	48
78	Vilberg Brothers Computing	34
79	VOAD Systems	35
80	Woodchuck Industries	29

See The Marketplace for further Reader Service information.

1. **In ScreenWriter, make single-letter macros for all the keys you want to change. For example, %(return) then Ctrl-O then X, so that contro-O prints out "x." Do this for all the keys you want to change. Remember the order you do them in. Now, save the macro, like !MACRO,D2.

2. Next, exit to BASIC and type HIMEM:17000 and then BLOAD MACRO,d2. Now enter the monitor with CALL-151.

3. Now you can insert the hex values of the Esc-Ctrl sequences into the macro table. These are the ASCII codes for the control characters, without the high bit set. (Normal non-escape characters have the high bit set.) In our example, Ctrl-P is hex 10. See the Apple manual. The value goes at $466D. So, type "466D:10." If you are doing several keys, they go at every second location from there on, like 466F:09 and 4671:08 or whatever.

4. Now save your finished macro table: Ctrl-C to get to BASIC, then BSAVE MACRO,A$452D,-L$01C1. That's all. The table will load normally in ScreenWriter, like "MACRO,D@" and you add other "normal" macros to it and save it normally.

If this is to be completed, you could easily translate the monitor commands into POKEs. If you don't think the end-user can look up control codes, you could publish instructions for a pre-made set of macros. Mine go like this:

In ScreenWriter, make macros for these keys, in this order, to set them all to "x": Ctrl-O, Ctrl-X, Ctrl-Q and Ctrl-Backslash. The hex version of the POKEs is: 466D:10 00 1A 00 11 00 98.

This makes Ctrl-O do "page up," Ctrl-X do "back one word," and Ctrl-Q do "delete word." Also Ctrl-Backslash does the "literal" that Ctrl-X used to do. You could add to it so that some other key did the overstrike, and no functions would be lost.

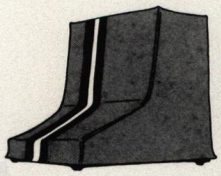
I hope this is useful to you. Feel free to use it as you see fit. Please write or call me at (313) 761-1514 if you have any questions.

Sincerely, etc.

I am disappointed but not too surprised to find that this information never made it to the users. I would have thought that On-Line's easiest course of action might be to include a pre-made macro file on the disk, with maybe an alternate command summary card to go with it. In any case, I hope this is of help to the many users of this excellent word-processor.

Erik Kauppi

'Protect Your Apple'



Preventative Maintenance with an attractive, durable, 100% cotton static free cover

by SOFT WEAR COMPANY

Box 974, Ganges, B.C. V0S 1E0
CANADA (604) 537-5066

Red Blue Grey Beige

☐ $22 II/IIe & III CPU/Key/Mon 1 pc.
☐ $24 II/IIe & III CPU/Key/DuoDr/Mon 1 pc.
☐ $22 Macintosh ☐ $20 Apple IIc
☐ $12 Printer 16 x 12 ☐ $8 Double Drive
☐ $12 Printer 17 x 14 ☐ $6 Single Drive
☐ $6 MAC Drive ☐ M.O. ☐ Cheque

Visa # _____ Exp. date ____
U.S. Funds. Send dimensions for custom order.
Name _____
Address _____
City _____ Country ____
Signature _____
Add $3 shipping. In B.C. add 7% sales tax.
SATISFACTION GUARANTEED!

Circle 74 on Reader Service Card

For Your APPLE**

e-Z CARD

Uses Z80A CPU Needed for WORDSTAR, dBASE II**, MULTIPLAN** and runs all 2.2 CPM** PROGRAMS. We use all "I.S" devices to save power and the card will execute full Z80 and 8080 instruction sets, including Z80 interrupting. Software not provided.** KIT:$55.00 READY TO USE:$80.00

128K CARD w/Built-in Disk

The ORBITAL 128K RAM CARD with a disk drive built-in, will expand the memory of your Apple*II, II+, IIe another 128K or can be used as a second disk drive. The ORBITAL 128K CARD emulates a disk drive but, not like the standard mechanical drives, the ORBITAL 128K CARD is ten times faster. It is faster because it fits inside the Apple* just like any other card and has no motor to turn on or off. KIT:$199.00 READY TO USE:$229.00

IIe 64K 80 COL CARD**

Expand your IIe with 80 COLUMNS and 64K MEMORY including double high resolution graphics on "B" motherboard**
KIT:$85.00 READY TO USE:$100.00

COPYCARD

The COPYCARD is capable of making archive copies of your copy-protected software, a must for game players. The COPYCARD converts a copy protected program into a non-copy protected program in a standard COPY A format, giving you the opportunity to correct the software to use non-supported hardware, Typical hardware changes are for 80 column cards, printer interfaces, and other I/O devices. NOTE, SYSTEM REQUIREMENTS: Apple* II, II+ require 16K RAM card and one disk drive with 3.3 DOS. WILL NOT WORK at this time with Apple* IIe computer. COPYCARD comes with utility software. KIT:$50.00 READY TO USE: $80.00

MasterCard VISA Accepted. AZ residents add 6% sales tax. SHIPPING CHARGES: ADD $1.74 per. UNIT C.O.D. ORDERS: $1.90 per ORDER

LIFETIME WARRANTY
ORBITAL SYSTEMS, INC. warrants their products to be free from defects in material and workmanship for the LIFETIME of the product. GUARANTEE: For kits only. IF YOU ARE UNABLE TO GET YOUR KIT TO WORK, for a fee of **$30.00** *plus* **$2.50** *postage and handling, we will correct any errors in soldering and/or blown chips, and mail your card back ready to use. After six months, LIFETIME warranty in effect on kits.*

Dealer Inquiries Invited

**CPM trademark Digital Research
**Multiplan trademark of Microsoft
**D Base II trademark of Ashton Tate
**Apple is the trademark of Apple Computer, Inc.
**Wordstar is a trademark of Micro Pro, Inc.

Orbital Systems, Inc. TM

ORBITAL SYSTEMS, INC.
5225 E HEARN RD.
SCOTTSDALE, AZ. 85254

CALL TO PLACE AN ORDER:
(602) 830-6457
(602) 996-5064

9 a.m. - 4 p.m., Mon.- Fri.

Circle 71 on Reader Service Card

The Marketplace

The following items are selected by our editorial staff from the large number of product announcements and news releases sent to us daily. They are presented solely to keep you informed about the current market for Apple related hardware and software. As we have not tested many of these products, appearance here does not necessarily represent endorsement or recommendation by A.P.P.L.E. Further information about items appearing in The Marketplace can be obtained through the Reader Service Card. If you contact any manufacturers directly, please mention that you learned about them in *Call-A.P.P.L.E.*

APPLEWORKS FOR THE II

Norwich Data Services Ltd. has developed a patch which allows Apple II and II+ users to run Appleworks. The system requirements are as follows:

- 64K Apple or Apple compatible
- Videx hardware compatible 80-col card with inverse
- Shift key modification
- RAM card (for XM version)

All AppleWorks functions are available directly from the keyboard.

- One time configuration, no preboot required.
- Program does not use 80-col, firmware, therefore many cards (Videoterm, Ultraterm, Viewmax, Franklin, Magnum etc.) are supported.
- No unpopular or expensive card purchase necessary.
- Remaps keyboard, no joystick or paddle buttom needed to emulate the open apple key.
- XM version provides desktop expansion to as much as 72K supporting Ramcards (Legend, Saturn, etc.)
- Low cost

PLUS-WORKS v1.0 sells for $19.95 plus $3.00 shipping (provides 10K desktop). PLUS-WORKS-XM sells for $49.95 plus $3.00 shipping (expands desktop to 72K with 64K Ramcard. XM version available to registered users of V1.0 for $29.95. *Norwich Data Services Ltd. PO Box 356, E. Norwich, Ny 11732-0356 (516) 922-9584.*

Circle 1 on Reader Service Card

BASIC TO PASCAL

WOODCHUCK INDUSTRIES announces the availability of P-tral, BASIC to Pascal translation software. P-tral is a language translator that makes it possible for the programmer to convert any of his Applesoft BASIC programs to Apple Pascal. P-tral reads the BASIC source program from disk and generates the equivalent Pascal source code. The program is "disk based" and is capable of translating commercial applications. Supplied with the program is full documentation that includes a demonstration run of the program.

The system requirements include: Apple II, II+, *//e*, or *//c*, 64K memory, 80 column display, 2 disk drives, Apple DOS 3.3 — Apple Pascal 1.1 or 1.2.

Price: "PIONEER" users can purchase this product for $125 until next fall. At that time a new version will be available for $250. There will be a $25 upgrade charge to "PIONEER" users. *WOODCHUCK INDUSTRIES, INC., 340 West 17th Street #2B, New York, NY 10011 (212) 924-0576*

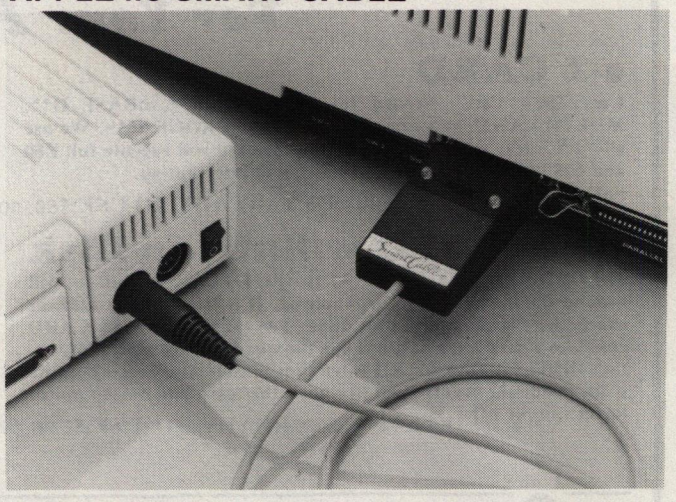
Circle 2 on Reader Service Card

//c SYSTEM CASE FOR EASY TRAVEL

It's often a problem when you need to move an entire computer system from one place to another. Fiberbilt Cases, Inc. offers a solution with this sturdy case that holds the *//c* computer with a *//c* monitor on its stand, and an external disc drive. It even has an extra foam padded compartment to hold a mouse or modem. Fiberbilt case #20439 is made of black polyethelene plastic and measures 21x13x16. It features a tongue-and-groove aluminum frame and steel corners for durability and, as with all fiberbilt computer cases, a key lock is standard. Price: $175.00. To order, write or call *Fiberbilt Cases, Inc., 601 West 26th Street, New York, NY 10001-1199.* Amex, Visa, and MC are accepted on phone orders by calling *800-847-4176*, or inside NY State *(212) 675-5820.*

Circle 3 on Reader Service Card

APPLE *//c* SMART CABLE



Bellevue, WA — IQ Technologies announces a solution to the **Apple *//c* printer cable problem.** The Apple *//c* serial port requires a 5-pin DIN connector while most peripherals use standard 25-pin serial connectors. The new Model SC809 Smart Cable eliminates the need for both a special 5-to-25-pin adapter and a custom cable. It connects the Apple *//c* to a printer, plotter or modem with one cable, simply and inexpensively.

The SC809 is an intelligent interface cable that looks at the signals coming from the Apple *//c* and the peripheral and uses its own built-in "intelligence" to make the right connections. All the user needs to do is plug-in the cable and set one switch. The SC809 matches up all the data, handshake and control lines automatically. Another peripheral can be connected by just plugging-in the Smart Cable and resetting the switch.

Suggested price is $49.95. Complete information is available from *IQ Technologies, Inc., 11811 N.E. First Street, Bellevue, WA 98005, (206) 451-0232.*

Circle 22 on Reader Service Card

NEW EPSON PRINTER FOR THE HOME

HomeWriter 10, a new dot matrix printer that offers easy plug-in compatibility with the most popular home computers, has been introduced by Epson America, Inc. HomeWriter 10, which also provides dual mode printing, is the company's first printer product directed specifically to the home market.

A sleek new 80-column printer, HomeWriter 10 connects with popular home computers via Epson's new plug-in Printer Interface Cartridges (PICs). Each PIC is a combined ROM cartridge and cable that connects the printer to a specific computer. The PICs plug in as easily as an electrical cord into an ordinary wall socket.

Initially, Epson will offer PIC cartridges for most home computers, including the Apple *IIc*. The company eventually plans to manufacture PICs for most major brands of home and personal computers so that users can link the HomeWriter 10 to any computer in the household.

The HomeWriter 10 operates in both draft and near letter quality modes and, with Epson's exclusive SelecType feature, offers all the most popular typestyles. The printer operates at over 1000 words per minute (100 cps) in draft mode and at over 160 words per minute (16 cps) in near letter quality. With no special programming, SelecType enables printer users to choose combinations of print styles—such as condensed, emphasized, doublestrike or near letter quality—simply by pushing buttons on the printer's control panel.

HomeWriter 10 prints both bidirectionally and unidirectionally. It also features typewriter-style friction paper feed, a 1K buffer memory and optional tractor and cut sheet feeders.

The HomeWriter 10 will be available through Epson printer dealers at a suggested list price of $269 for the printer and $60 for each PIC. Both will come with easy-to-use instructions and Epson's standard one-year warranty. Suggested list prices for the optional features will be $39.95 for the tractor feed and approximately $99.95 for the cut sheet feeder.

Epson America is headquartered at *2780 Lomita Blvd., Torrance, CA 90505, (213) 539-9140.*

Circle 4 on Reader Service Card

PRINT SHOP'S ANNEX

THE GRAPHICS LIBRARY, DISK TWO—like THE PRINT SHOP GRAPHICS LIBRARY, DISK ONE—provides additional designs, symbols and pictures for do-it-yourself graphic creations, but this time in six new categories: Jobs, Hobbies, People, Places, Travel and Health. DISK TWO includes images as diverse as a portrait of George Washington, a San Francisco cable car, a handyman's tools and a DNA strand.

THE PRINT SHOP lets users write, design and print their own greeting cards, letterhead, banners and signs with no knowledge of computer graphics or graphic design. The program includes a variety of type faces, borders and graphic images and also lets users modify existing graphics or design their own.

THE PRINT SHOP GRAPHICS LIBRARY, DISK TWO is available for any Apple II. Requires: Printer, disk drive, 48K memory. Price: $24.95. *Broderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101 (415) 479-1170.*

Circle 5 on Reader Service Card

AUTOMATED BRAILLE TEXTBOOK PRODUCTION PRODUCT

BETTE, the first microcomputer software to greatly simplify the production of braille textbooks is now available. BRAILLE-EDIT Textbook Transcribing Edition builds on the well-received BRAILLE-EDIT multi-media word processing program that supports voice, large print, regular print and braille output. BETTE supports many braille output devices, including the Cranmer Modified Perkins Brailler, the Visualtek MBOSS-1, the Theil, LED-15, and LED-120 embossers, and the Versa-Braille "paperless" brailler.

BETTE supports both print and braille input and output. BETTE translates from grade II (contracted) braille to print and from print to grade II braille. BETTE can read Apple DOS 3.3 ASCII text files and also import data from other computers through a direct serial connection. Special routines support use of the Kurzweil Reading Machine as an optical scanner.

BETTE requires an Apple II+, *IIe* or *IIc* with at least 64K memory. Two disk drives are strongly recommended; some proofreading modes require 80-column card. Retail price: $400 *Raised Dot Computing, Inc., 408 South Baldwin Street, Madison, WI 53703, (608) 257-9595*

Circle 6 on Reader Service Card

64K/80 COLUMN CARD

for APPLE IIe only $65.00

FEATURES:
1. 64K Memory (makes IIe 128K Total).
2. Memory Select/De-Select.
3. 80 Column text select.
4. Supports Double High Resolution Graphics (560x192 Pixels).
5. Five Year Warranty.

APPLE Compatible DISK DRIVES

II+, IIe $129.00

IIc - - - $135.00

180 DAY WARRANTY

SPEED UP Card For The Apple

Works on II, II+, IIe and Franklin ACE

A MUST For All Spread Sheet Users

Makes Your Computer Run 3½ Times Faster

5 Year Limited Warranty

only $150.00

ORDER NOW!

MEMORY PLUS DISTRIBUTORS
2632 W. Baseline Road
Mesa, Arizona 85202
(602) 820-8819

- Add $3.00 shipping to all orders
- MasterCard & Visa okay
- C.O.D. add $2.00
- More products available
- Dealers' inquiries invited
- Computer Club discounts

MANY MORE APPLE PERIPHERALS CALL FOR PRICES

Circle 69 on Reader Service Card

LISTABLE GAMES

Hacker Jack has developed three games, Video Vegas, Ted Bear Discovers. . . Rainy Day Games and Guitar Wizard. Each program is listable allowing the user to not only see how the program was constructed, but also to customize it.

- *Video Vegas* features authentic casino action. Blackjack, Draw Poker, Slots, and Keno provide entertainment fo the beginner and challenge for the pro.
- *Ted Bear Discovers. . . Rainy Day Games* is the 3 in 1 card game package for young people of all ages. Children and their new playmate, Ted Bear, bring to life the classic games of Concentration, Old Maid, and Go Fish.
- *Guitar Wizard* sharpens the skills of both the novice and experienced guitarist. Learn and analyze scales, chords, and tunings for all types of fretted string instruments.

All three programs retail for $29.95. *Baudville, 1001 Medical Park Drive SE, Grand Rapids, MI 49506 (616) 957-3036.*

Circle 7 on Reader Service Card

TERMINAL SOFTWARE UPDATED

Softerm is now available for the *IIe* and *IIc* computers. Its features include keyboard macros, built-in phone book for automatic dialing, and simultaneous capture to print on disk. Softerm's file transfer capabilities provide automatic execution using command files, support for popular protocols like XMODEM, and our own Softrans protocol which comes with an adaptable source program for host computers.

The new product is available in two versions for the Apple. *Softerm 1* provides basic TTY terminal emulation, and is ideal for accessing information services and bulletin boards. (Price: $135.) *Softerm 2* has all the features of Softerm 1 plus it provides exact emulation of 24 popular CRT terminals used for accessing company mainframe computers. (Price: $195.)

Softronics, Inc., 3639 New Getwell Road, Suite 10, Memphis, TN 38118 (901) 683-6850.

Circle 21 on Reader Service Card

DISCOUNTS

$10.00 Box of 10 SS/DD diskettes, 5-1/4" soft-sectored, hub ring, envelopes • 100 for **$89.00** • Double-sided double density • 10 for **$14.00** • 25 for **$32.50** • 100 for **$125.00**

Hard Plastic Stand-Up Diskette Carrying Cases **$2.75** each or 4 for **$10.00** (beige, black, green, grey, red, yellow) • Smoked-Plastic Flip-Top 70 Diskette File Cases **$11.00** • 140 Diskette Locking Wooden File Cabinets **$33.00** • Heavy Duty Nibbing Tool **$19.00**

DISK DRIVES

$129.00 GAMMA DRIVE

Mitac **$139.00** • Fourth Dimension (Full or Slimline) **$159.00** • Controller Card **$59.00** • 10 Megabyte Hard Disk **$695.00**

COD and Visa/MasterCard orders welcome. UPS SHIPPING: $4.00 per order plus $6.00 per printer and monitor.

LONG DISTANCE; CALL TOLL-FREE FROM ANY TONE-GENERATING PHONE: DIAL 950-1088; (IF YOU RECEIVE A RECORDING, DIAL 800-446-4462 INSTEAD); WAIT FOR TONE; DIAL 363-1313.

(301) 652-4232 CALL FOR OUR FREE CATALOG

VP ASSOCIATES

8231 WOODMONT AVENUE, BETHESDA, MARYLAND 20814

Circle 77 on Reader Service Card

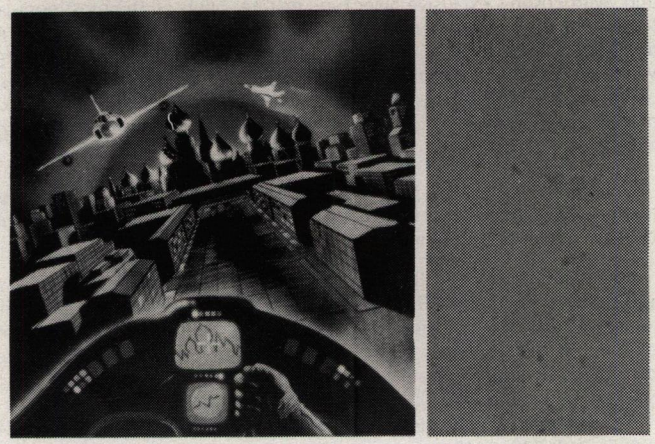
APPLE II +, *IIe* TROUBLESHOOTING AND REPAIR GUIDE

Apple II Plus / IIe Troubleshooting and Repair Guide takes users step by step through proper II +, *IIe* diagnostic techniques and lists specific malfunctions in trouble charts organized by computer subsystem. It is intended for 95% of those circumstances where knowledge and a good reference are enough to let a user find and repair a failure.

Apple II Plus / *IIe* Troubleshooting and Repair Guide includes coverage of periodic preventive maintenance to keep Apples healthy. There's information for those ready to go after the remaining 5% of failures, including advice on developing some custom diagnostic tools in both hardware and software form. Price: $19.95. For details, contact *Howard W. Sams & Co., Inc.* at *1-800-428-SAMS.*

Circle 9 on Reader Service Card

TWO NEW GAMES



ACCESS Software Inc, annouces the release of two award winning action/strategy games, BEACH-HEAD and RAID OVER MOSCOW for the Apple II computers. Both games are disk-based, run on all Apple II's and work-alikes with a minimum of 48K and support joystick play. A provision for recording high scores is included in BEACH-HEAD, and both games feature a demonstration mode for practice with phases of the game.

Both games retail for $34.95. *ACCESS Software Incorporated, 520 Havens Cove Road, Bricktown, NJ 08723 (201) 920-7527.*

Circle 8 on Reader Service Card

BASIC WINDOWS

Windows is a machine language utility program for BASIC programmers. It adds ten new commands to Applesoft BASIC, which allow you to create windows in the Apple text screen, display any message, menu, etc. right over the existing text, without destroying the original display. Text inside windows scrolls independently. In addition, Windows allows you to split the screen vertically and horizontally, use each half separately, create other special effects.

To use Windows you will need an Apple II with 48K and one disk drive. *Assembly Corner, 11601 NW 18th St., Pembroke Pines, FL 33026 (305) 431-6892*

Circle 10 on Reader Service Card

UNIVERSAL BULLETIN BOARD

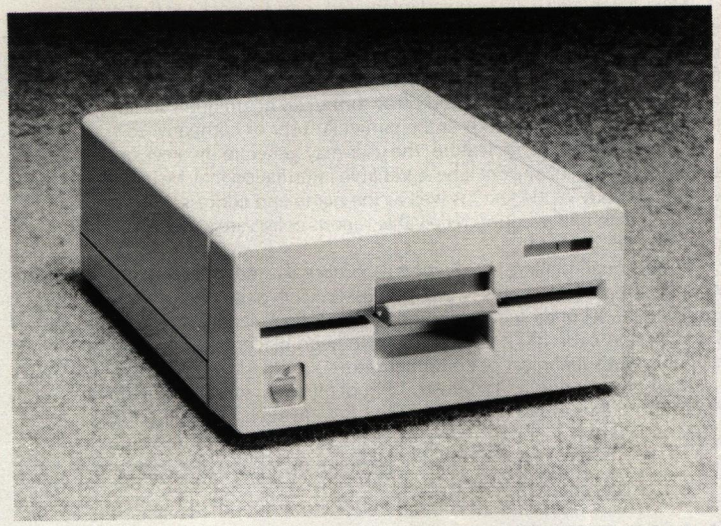
AIM (The Association of Independent Microdealers) announces the introduction of the Universal Bulletin Board system. It runs under the Apple II family of computers. The UBBS system is menu driven and supports most hardware configurations including modems, clock cards, floppy disks, hard disk drives and more.

Features include: multiple message bases up to 10, up/down load, on-line games, variable system access, electronic mail, text editor, a built-in terminal program, and excellent report capabilities.

The UBB has been created to provide a low priced and secure internal communication system between a host computer at the place of business or home location and remote personal computers that can access the host computer via telephone lines. Price: $149.95. *Association of Independent Microdealers, 3010 N. Sterling Ave., Peoria, IL 61604 (309) 685-4843.*

Circle 11 on Reader Service Card

UNIDISK FOR APPLE II



Cupertino, CA — Apple Computer announces a single half-high floppy disk drive offering all Apple II users the same compact styling of Apple's DuoDisk dual-disk drive. Called UniDisk, the new drive provides full compatibility with the software available for the Apple II family of computers.

Designed to complement the Apple II case, UniDisk contains a 5¼-inch drive mechanism that provides 143 kilobytes of storage capacity. The new drive is functionally identical to Apple's Disk II drive, which it replaces.

UniDisk is based on the improved disk technology such as the eject mechanism and an advanced head positioning mechanism which gives a more precise reading of half-tracks.

UniDisk may be purchased with or without a controller card for any Apple II, Apple II+ or Apple *IIe* computer; however, the first UniDisk purchased must have the card in order to connect the drive to the Apple II. Each controller card supports up to two UniDisk drives, so customers who wish to expand their system can easily add a second UniDisk by plugging the cable from the second drive into the back of the first drive. UniDisk is designed to be easily stacked for those users who require more than one.

When UniDisk is purchased with a controller card, customers also will receive ProDOS, Apple's disk operating system for its Apple II family of computers. The controller card that comes with UniDisk is not compatible with the controller card that shipped with the Disk II. Those Apple II, Apple II+ and Apple *IIe* users who have one or more Disk IIs connected to their systems and who want to purchase another single disk drive must purchase a UniDisk with a controller card.

The new drive comes with Apple's standard 90-day warranty. The price of UniDisk with a controller card is $429. Without the card, $329.

Circle 12 on Reader Service Card

RUNNER'S RECORD

Whether you train to win or run for fun, RUNNER'S RECORD provides an objective, easy-to-use program for keeping track of your running progress. Some of its advantages include:

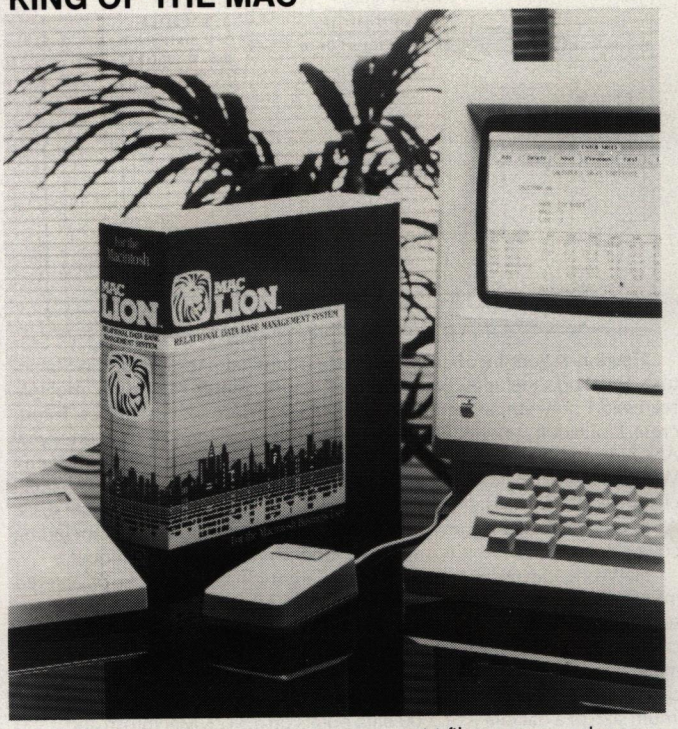
- It was designed by runners for runners.
- Because it is written in assembly language, RUNNER'S RECORD calculates useful and interesting information almost instantly.
- Virtually ever instruction needed to operate RUNNER'S RECORD appears on the screen.
- It comes with a complete, step-by-step manual.
- One program can be used by every runner in the family.
- Enter multiple runs for a single day.
- You can keep permanent records of your races and daily runs on disks or print-outs.
- On a single disk, you can store up to two years of daily runs and up to 75 races in each of 13 race-distance categories.

Required: Apple II+, Apple *IIe*, *IIc*, 48K and one disk drive. Price: $24.95. *KNS Software, PO Box 9777, Denver, CO 80209 (303) 722-4831.*

Circle 13 on Reader Service Card

MacinPlace

KING OF THE MAC



MacLion gives users access to as many as 14 files at once so they can organize and manipulate data from different categories to create serious business applications. Sales lead tracking, job costing and sales order entry systems are only some of the applications that have been developed on MacLion.

MacLion utilizes the system's mouse device, pull down menus, icons and dialogue boxes. Key features that differentiate MacLion from other database managers are its ability to access and manipulate multiple files simultaneously, built-in program development language, screen and report generators, a data dictionary, and flexible data inquiry commands for retrieving informaion.

MacLion features a high-level procedural language, Leo, which can add unlimited functions to database applications. Screen and report generators let the user create formats that represent actual forms, thereby improving data entry speed and accuracy. Through the data dictionary, structural information such as the size of a zip code field can be changed on a global basis.

English data inquiry commands enable users to call up information quickly in any order they wish—by customer name, state, or product number. MacLion requirements are the 128K Macintosh and two disk drives. The recommended configuration, however, is the 512K Macintosh, on disk drive and one hard disk.

The suggested list price is $379. *COMPUTER SOFTWARE DESIGNS, INC., 1904 Wright Circle, Anaheim, CA 92806 (714) 634-9012.*

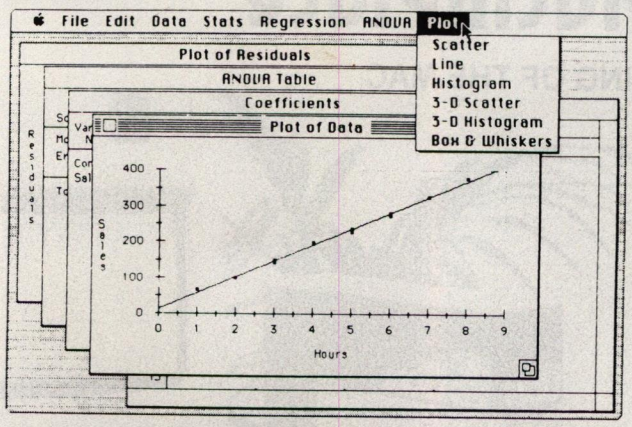
Circle 14 on Reader Service Card

SERIAL TO PARALLEL CONVERTER FOR MAC

The Mac Port Adapter, a hardware device which converts data output from serial to parallel form, is available for Apple's Macintosh. This device gives the Macintosh the added capability of powering all parallel peripherals, such as IBM-compatible serial port as well as a Centronics-compatible parallel port, users maintain the use of their serial port while gaining the additional parallel port.

Mac Port Adapter more than doubles the range of peripherals now available for use with the Macintosh. This device is of value to Macintosh users who already own a parallel printer because it saves them the cost of purchasing another printer to run with the Macintosh. The Mac Port Adapter includes a five-foot-long parallel cable with a 36 pin Centronics connector. Price $79. *Assimilation Process, Inc. 485 Alberto Way, Los Gatos, CA 95030 (408) 395-7679.* **Circle 15 on Reader Service Card**

MAC STATS



Heydon & Son, Inc. has introduced a statistical package for the Macintosh. *StatWorks* includes statistical routines for: simple regression, multiple regression, polynomial regression, a full range of descriptive statistics, T-test, cross tabulations, normality tests. Kolomogorov-Smirnov test, one-way ANOVA, and two-way ANOVA. Nonparametric routines include: Mann-Whitney U test, Wilcoxon signed rank test, Spearman's correlation coefficient, Kendall's correlation coefficient, Kruskal-Wallis and Friedman tests. All tests include significance levels. Regressions have full output including coefficient window, ANOVA window, and residual analysis window.

StatWorks can use data from many different sources. Data can be entered into the system manually or transferred from other Macintosh applications such as: MacPaint, MacWrite, MultiPlan, Chart, and Jazz. In addition, data can be transferred from any other mainframe or microcomputer via MacTerminal. Once in the system, data can be sorted or transformed. Data elements can be cut and pasted between datafiles to create new datafiles. The maximum size of a datafile is 50,000 data points on a 512K Macintosh and 1500 data points on a 128K Macintosh. All statistical calculations are carried out to 19 digits.

Results of any analysis can be output to printer using Line plots, Scatter plots, Histograms, Box and Whiskers plots, 3-D Scatter plots, and 3-D Histograms. Results may also be cut and pasted to the clipboard for use in MacPaint and MacWrite documents.

For further information contact *Heyden & Son, Inc., 247 South 41st Street, Philadelphia, PA 19104 (215) 382-6673.*

Circle 16 on Reader Service Card

MAC-BAR CODE READER

The Computer Identics SCANSTAR-Mac is an on-line bar code scan/decoding terminal designed to add bar code reading capability to the Apple Macintosh desktop computer. Requiring no hardware or software modifications, it allows bar coded information to be read and stored in any other Macintosh software package. When used in conjunction with Mac-Barcode label generating software, it transforms your Macintosh into a complete, low-cost bar code workstation.

Adding bar code reading capability to a Macintosh will improve the accuracy and speed of data collection for a variety of inventory and production control applications by eliminating error prone keyboard entry. Bar-coded information is read with an easy-to-use, heavy-duty stainless steel lightpen supplied with the SCANSTAR-Mac. An optional lightweight digital lightpen, handheld laser scanner, and a slot reader are also available.

Easily installed between the Macintosh keyboard and main unit, the SCANSTAR-Mac is progrtam transparent and doesn't interfere with normal keyboard operation when not in use. The SCANSTAR-Mac also provides an auxiliary RS-232C asynchronous serial port to allow data input from a SCANSTAR 500 series portable bar code reader or similar devices. The Macintosh will not distinguish between data originating from keyboard entry, bar code reading, or serial port input.

Standard features of the SCANSTAR-Mac include bi-direction bar code decoding logic for the most commonly used bar code formatsl; and audible and visual confirmation of operating status through various audio tones and front panel LEDs. Bar code formats include: Code 128, Interleaved 2-of-5 Code, Straight 2-of-5 Code, 3-of-9 Code Full ASCII, Codabar, ABC Code, UPC Code, EAN Code, Code 93 and Code 11.

Price: $600. *Computer Identics, 5 Shawmut Rd, Canton, MA 02021 (617) 821-0830.*

Circle 17 on Reader Service Card

MACOFFIX

MacOffix is a visually oriented integrated software package that combines database, word processing, mail merge, and report generation functions. MacOffix was designed to integrate the most frequently used office functions into one program. With the forms design feature invoices, sales order forms, patient records, and other forms can be uniquely formatted to meet the individual needs of the particular user or company.

Using the mail merge feature, the user may generate invoices or personalize direct mail or print labels. Variable information may be included within the body of the text, as well as the name and address. Inventory, monthly sales, and accounts receivable reports or lists are generated from the files in the system.

Professional-looking letters, memos, proposals, and other documents may be created using the word processor. The page layout may be modified in seconds to accommodate letterhead, labels, or invoices. Tutorials and over 100 help screens have been placed on-line and the manual avoids technical or computer terms.

MacOffix requires a Macintosh, 128K of memory, and one disk drive. Price: $149. *Emerging Technology, 1877 Broadway, Boulder, CO 80302 (303) 447-9495.*

Circle 18 on Reader Service Card

A LISP FOR MAC

ExperLISP for the Macintosh is the first *complete* implementation of LISP on a microcomputer. Developed on a Symbolics 3600, the compiler generates code optimized for the MC68000 microprocessor. Users have access to numerous graphics routines, pull down menus, multiple windows, and operating system routines plus the power and speed of Lisp code.

ExperLISP supports large program libraries because it supports "virtual" space for procedures and data structure. *Load-On-Call* means that ExperLISP automatically fetches code from disk as it is called from a running program. It does this by managing the entire functions, files of functions, and arrays as rewources that are automatically paged to disk when space is needed and automatically retrieved when they are accessed by your program. It also lets you run programs larger than the machine's memory because only the code for the currently executing function need be in RAM at any given time.

ExperLISP's default user-interface is an interactive editor/interpreter buffer where the user can edit and evaluate expressions and output. Editor windows on files can be simultaneously displayed, and text can be moved among them by cutting and pasting. Similarly, a graphics window and a text window can share the screen.

The retail price is $495. *ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108 (805) 969-7874.*

Circle 19 on Reader Service Card

DATA SECURITY FOR THE MAC

Hippopotamus Software, Inc., announces the availability of Hippo-Lock, The Hippo Business Data Security System for the Macintosh.

Hippo-Lock protects the privacy of data files containing sensitive information. Confidential data such as business plans, sales projections, employee reviews, payroll information, management proposals, grades, MacPaint pictures, etc., can be protected from prying eyes.

Hippo-Lock scrambles the contents of a file once the user creates a keyword phrase. The keyword phrase can be up to thirty characters in length. Once a file has been scrambled, the exact original keyword phrase must be entered in order to unscramble the file.

Hippo-Lock uses the Data Encryption Standard (DES) originally designed by the Department of Defense and now in use by major U.S. corporations. Hippo-Lock has an added feature: the ability to select the level of security at which a user wishes to encode a file. A user may select from among three levels of security — low, medium or high.

Hippo-Lock works with Macintosh floppy microdisks, hard-disks, over the AppleTalk Office Network, and can be used to scramble electronic mail and data going over telecommunications systems such as MCI mail, EasyLink, and CompuServe.

Hippo-Lock retails for $119.95, and is available through software dealers, or directly from *Hippopotamus Software, Inc., 985 University Avenue, Suite #12, Los Gatos, CA 95030, (408) 395-3190.*

Circle 20 on Reader Service Card

Unclassifieds

Members Non-commercial rate .05/word
Members commercial rate .25/word
All others: 1.00/word, $25 minimum
Send ad copy with payment to editorial office. Unclassified copy must be received by the fifteenth day of the month, two months preceding the date of issue. For example, ad copy for September must be received by July 15th.

SKYFORTH PROGRAMMING LANGUAGE—Super-fast compiled system with integer and floating pint arithmetic, super hi-res graphics and screen editor. Requires 64K Apple II/+/e/c. Easy-to -use yet very powerful. $59 (WA +7.8%). Demonstration disk available for $450. Call or write for more information. TOSCH INFORMATION MANAGEMENT; 16025 10th Ave SW, Seattle, WA 98166 (206) 246-3839.

FREE SAMPLES!-Our DISKINVOICE SYSTEM (Apple INV/AR package), is perfect for any small business. Only $55.00 COMPLETE! Reliable, tested, unparalleled. Effortless to learn, simple to use. Two disks, excellent documentation. Extremely friendly, thoroughly professional and USEFUL! Why pay more? Write: BROADWAY SOFTWARE, Suite 136, 660 Amsterdam, New York, NY 10025.

DON LANCASTER'S TOOLKITS—Sixteen disk sides chock full of AppleWriter goodies: patches, sourcecode, Diablo microjustify, proportional space, disassembly script, answers, self-prompting glossaries, bonus book, bunches more. AWIIe or ProDOS 2.0 kits, $39.95 each, $59.50 for both. SYNERGETICS, Box 809-NB, Thatcher, AZ 85552. VISA/MC accepted. (602) 428-4073
(8 disk sides per kit.

ABSOLUTE //e///c RESET—To the "old" monitor ROM. Don Lancaster puts you back in total control. Capture routines, source code, detailed instructions, bonus book, $19.95.SYNERGETICS, box 809-NB, Thatcher, AZ, 85552. Visa/MC accepted. (602) 482-4073.

$8 (U.S.) INCLUDING DISK!-Over 1000 famous business, education, and game programs for II, //e. Details: $1 (U.S.) to Reliant, P.O. Box 33610, Sheung Wan, Hong Kong.

RENT SOFTWARE $5 MONTHLY—No membership fee. Send large $.39 SASE: Preowned software, 4229 Baker Ave NW, Seattle WA 98107 for list.

SUPER DUPER!-Very Fast Copy Program for DOS 3.3. Back-up from hard disk (such as Corvus or Sider) to floppy in as little as 35 sec. per volume. Use Non- options to copy range of volumes. Also contains patch to operate Corvus and Sider simultaneously, $29.95, Johnson Associates, 6342 W Bell Road, Glendale, AZ 85303 (602) 979-4554

FOR SALE (or trade)—Vista V-1200 6MB catridge disk drive with Apple interface. Best offer over $200. Michael Ching, 2118 Kula Street. Honolulu, Hawaii 96817 (808) 595-8131

RGB COLOR MONITOR—Electrohone 12in 1302-1 with supercolor Apple II+ slot driver card and software. Completely compatible with 40 column text, lo/hi-res BASIC, Pascal, Logo, games, graphics. Includes NTSC Composite/Audio module for non-RGB or VCR use. $400 or best offer. Ross Lunan, 967 Flying Fish St, Foster City, CA 94404-1455.

MORE BANG FOR THE BUCK!-Send us $1 and a disk and we'll pack it with utilities, games, copiers, and more! Send disk and dollar to: The Apple Crackers, RR2 Box 106, Lake City, MN 55041.

STUCK ON ANY INFOCOM ADVENTURE?—Find the solutions (or just some hints) to all 15 Infocom adventures on AdventureTip Disk #1. Get all these solutions for only $1.00 each. AdventureTip Disk #1 costs only $15.00. Check/MO/Visa/MC. AdventureDisk, Box 216, Mercer Island, WA 98040.

THE LOST ARK OF THE COVENANT—an all-new machine language hi-res adventure game for the Apple II, II+, //e //c with one drive (3.3 DOS). This adventure has won a gold medal in a Long Island Computer Show, and includes graphics routines from Penguin Software's Graphics Magician. With over 150 hi-res images, you can explore tombs, jungles, subterranean complexes, deserts and other enchanted terrains. This two-diskette adventure has taken over three years to create and can be yours for only $12.95. wih no postage charge! Send check or m/o to MICROSCAN, 1384 Lyon Place, Wantagh, NY 11793. Include $2 if you want hint sheets and a map of this 100 location adventure. Call (516) 826-5807 for more information.

WANTED—Non-profit organization seeks Apple computers(II or //e) or compatibles and related software and hardware for teaching children. Donations are tax-deductible. Call Bob Sackett (206) 246-7153, Seattle.

LOWEST EAMON PRICES ANYWHERE!-Choose from Units 1,2,3,4 or brand new #5. Each with 18 adventures & utilities on 9 disks for $35. Any 2 units for $60. 3/$85, 4/$110. All 90 exciting adventures for $135. Sample adv. @ $5. Check/MO/Visa/MC. Send to: AdventureDisk, Box 216, Mercer Island WA 98040.

ADVENTURE LOVERS WILL LOVE ADVENTUREDISK—A monthly double-sided disk with solutions and tips to hi-res and text adventures. On the back-side each month, there is a new Eamon adventure. The first month, you also receive an extra disk containing the Eamon 'Master Disk' and the new 'Advanced Dungeon Designer Disk'. Only return the first disk, keep the second. $9 to start and $6 each month thereafter. Check/MO/VISA/MC. AdventureDisk. Box 216, Mercer Island, WA 98040.

650 K DISK DRIVES:FOR SALE 3 RANA ELITE THREE!-650 double sided, double density disk drives with 4 drive controller card. Controller card allows for 4 drives which can be combinations of Rana drives or Apple drives. Supports Dos 3.3, CPM or ProDOS files. All manuals and extra disks included. $1000.00 for all. Leslie Roy (509) 452-8486, Rt. 1, Box 53, Moxee, WA 98936.

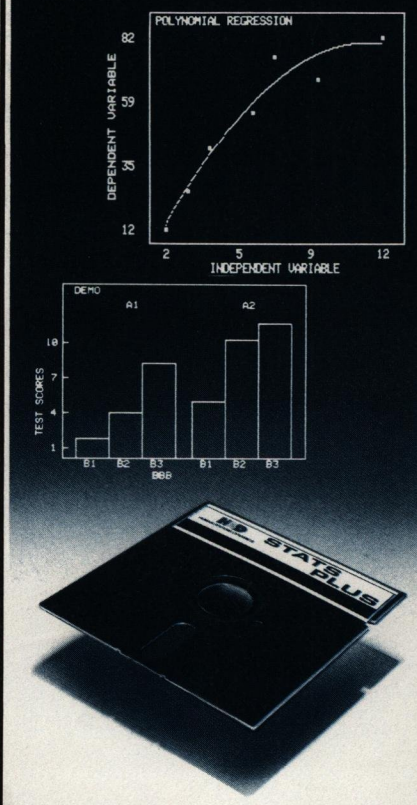
DEVELOPER DISK #1— From the center of the Silicon Prairie- DEVELOPTER DISK -1 (reg. $19.95) includes ProDOS/Applesoft Tutorial, the "Nite Owl Run Time" with the amazing QUICK INDEX, picture packer, INPUT Applesoft strings like a Word Processor and more. Double sided for //e///c only $10+$1 S&H. DAS Editor, The Applesoft Editor, for the //e///c (Reg. $39.95). Over 30 new ProDOS commands, like with manual, reference card. Satisfaction Guaranteed. For A.P.P.L.E. members $29+$1 S&H. NITE OWL PRODUCTIONS, 5734 Lamar Box Ap2, Mission, KS 66202 (913) 362-9898

PRINTWRITER—Applesoft text screen programming utility. Printwriter is a fast machine language program that allows you to design 40-column input and output text screens directly on the screen, then reads the screen and writes Applesoft PRINT statements to reproduce it in your programs. You have complete control over the line numbers Printwriter adds to your programs. The Printwriter disk includes Printwriter, and several other programming utilities, with demos and documentation. Doodle bug, an Applesoft game, is included as an example of how the utilities can be used in programs. For Apple II //e, //c, DOS 3.3 $19.95 postpaid to R.Plum, P.O. Box 1671, Des Plaines, IL 60018.

WE'LL DRIVE YOUR PLOTTER WILD—The DGI TYPE SHOP will turn your Apple computer and Hewlett-Packard or compatible plotter into a desktop publishing system. Price $175, additional fonts are $25 each. For additional information contact: Decision Graphics, Inc., P.O. Box 2776-CA, Littleton, Colorado, 80161, (303) 796-0341.

PROTOTYPING BOARDS $18.00 ea.—This 3.100 x 7.500 proto board is designed for use with 0.042 wire wrap posts and socket pins. Patterned for a medium density (0.300) IC spacing it easily accepts both 300 and 600 mill wide packages. Power and ground planes are provided with pads for power connections and decupling caps. Gold edge fingers and solder reflow make this proto board clean and reliable. Cost will be lower for higher quantities. Send check or money order to: FLYNN's Micro Products 1207 So. Palm Ave., San Gabriel, CA 91776. For C.O.D. orders CALL (818) 287-4343.

THE STATISTICS SERIES



Statistics Made Simple
Run Analysis Immediately
With **The Statistics Series**

STATS PLUS $200
Complete General Statistics Package
Research Data Base Management
Parametrics and Nonparametrics
Correlation, Regression

REGRESS II $150
Complete Multiple Regression Package
Stepwise, Simultaneous Solutions
Power Polynomial Solutions

ANOVA II $150
Complete Analysis of Variance Package
Analysis of Covariance, Randomized Designs

Apple II 48K, 1 or 2 Disk Drives,
DOS 3.3, ROM Applesoft

HSD
HUMAN SYSTEMS DYNAMICS

To Order—Call (800) 451-3030
(818) 993-8536 in CA
or Write
HUMAN SYSTEMS DYNAMICS
9010 Reseda Blvd., Suite 222
Northridge, CA 91324

VISA master charge

Circle 65 on Reader Service Card

■ **They're all winners:** Apricorn's Apple upgrades are designed and manufactured for trouble-free performance. All of our cards are totally software and hardware compatible, fully burned-in, tested, and socketed. Our comprehensive, illustrated manuals and Lifetime Warranty give you a winning hand, everytime.

■ **Super Serial Imager™:** This powerful new card replaces Apple's own Super Serial Card as the best RS-232 interface available for Apple // computers. In terminal mode, Imager's powerful built in communications firmware contains interrupt support for trouble free operation at 300-1200 baud and beyond with special support of most intelligent modems. In printer mode, it's a full featured graphics interface. Support provides full screen dumps to Apple Imagewriter printers and most serial interfaced graphics printers. Command compatible with graphics card described below.

■ **Graphics Printer Interface:** A potent graphics output card for parallel printers. Pictures and graphs from the hi-res screen as well as snapshots of the 40/80 column text screen are performed with a simple print command. Contains Grappler+ command set as subset for software compatibility.

pick a card, any card

APRICORN

7050 Convoy Court,
San Diego, CA 92111
(619) 569-9483

80 COLUMN VIDEO DISPLAY:
Expandable video display card for the Apple //e. Available in both standard and 64k versions. Standard version may be upgraded to an extended card with the addition of memory in slots provided.
PARALLEL PRINTER INTERFACE:
The standard interface for parallel printers. Features DIP switch selectable options.
EXTEND-IT:
64K add on board piggy-backs Apple's standard 80 Column Text Card. Expands Apple IIe™ to 128K, maintaining full compatibility with Apple's Extended 80 Column Text Card.
16K RAM EXPANSION:
The standard memory card for the Apple][and Apple][+ computers. Compatible with the Apple Language Card and the Microsoft RAMCard.
SUPER SERIAL IMAGER:
Apple Super Serial Interface Compatible. Full featured Graphics Interface with powerful built-in communications.

Circle 53 on Reader Service Card